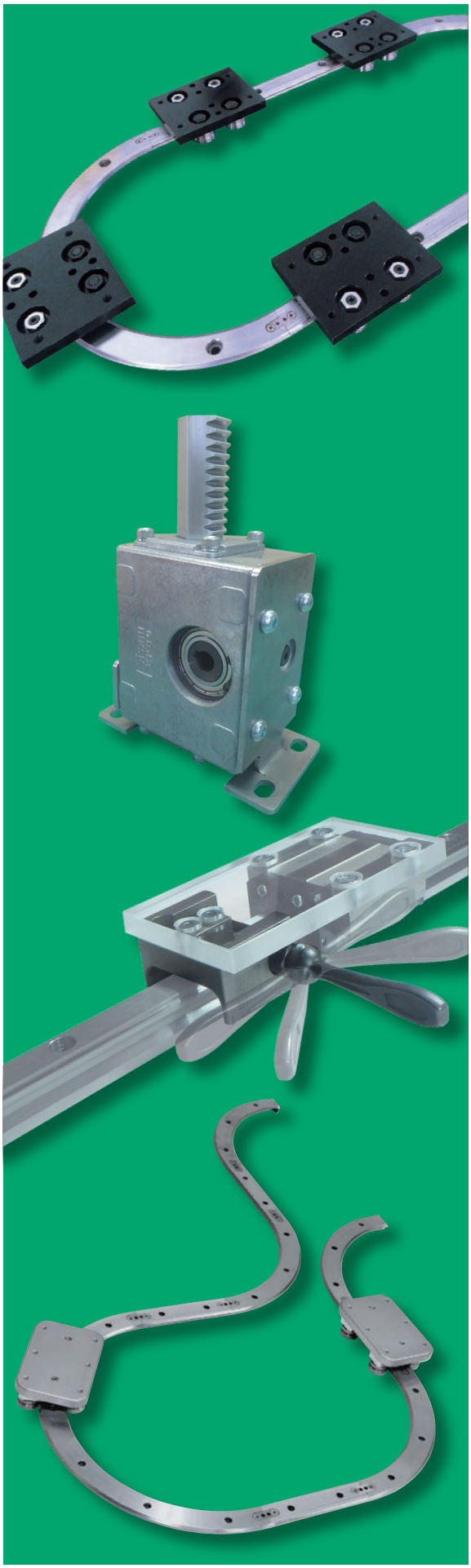
ASAHI

Cat.No.LE06

IQNET RECOGNIZED CERTIFICATION

CERTIFIED JQA MANAGEMENT SYSTEM ISO 9001 ISO 14001

JQA-1973
JQA-EM4783



Here contains Quality to support our needs and
Development Capabilities to catch your advanced needs

LINEAR MOTION

General Catalog

ASAHI SEIKO CO., LTD.

Introduction

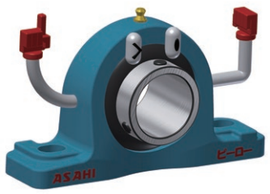
ASAHI SEIKO CO., LTD. is a manufacturer of insert bearing units and our insert bearing units are used worldwide due to their high quality and variety.

Since 1986, we have been engaging in manufacturing and sales of linear motion instruments, for cost-saving equipment such as work conveying systems and so forth.

Our products are used in various applications for linear motion, such as industrial machineries and machine tools, and are indispensable for our manufacturing world.
Examples among variety of our lineup are, Motion Guide System and Electric Pusher as guide device, and Linear Brakes for braking and holding of Linear guide rails. Lately, Hand Shaft Brake is newly added to our lineup, and it has unique 2-way braking method to rolling and linear motions.

To unceasing changes of society, we enhance the accuracy, performance, safety and cost-saving ability in order to reply our customers' needs. Thus, we are endeavoring in research and development of those products toward the goal of decarbonized society.

We offer products and services standing on same customers' positions, and would like to ask your long-lasting patronage.



ASAHI
Head Office, Factory

Warranty

Period of Warranty

・Period of Warranty is for one (1) year from the date of purchase of the goods by Buyer.

Scope of Warranty

・Subject items of the warranty are Linear Motion products manufactured and sold by Asahi, i.e. Linear Motion products and their parts, Air Brake products and their parts.

・Asahi shall, at its option, repair, or replace the goods free of charge, when Asahi found them to be deffective within the period of warranty.

・Asahi will charge to Buyer for repair or replacement if beyond the period of warranty.

Exemption

Warranty shall not be extended to the following case(s) even if within the period of warranty.

・Misuse and/or improper installation other than Asahi catalogs and/or operation manuals, and failure caused by unexpected operating.

・Failure or defect caused at Buyer by improper storage and/or handling, neglect, or error.

・Failure or defect which could not be caused if consumable parts or components were properly replaced as designated by Asahi catalogs.

・Failure or defect in case the products were used for other purpose than expected.

・Failure or damage beyond control by such as natural disaster.

Exemption of Liabilities

This warranty is limited to the products, and shall not be extended to the following portions.

・Any incidental loss or damage upon the defect/failure of the product.

・Expenses incurred at Buyer for replacement, re-installation and cordination of machines or equipments, test run, and other related operation.

・Improper conditions due to aged deterioration or storage, such as natural decoloration of paint and/or plated surface, rust, deterioration of grease, and oil separation.

・Conditions to the extent where they do not affect quality and performance of the products, such as appearance, sound, and/or vibration.

※ The dimensions, shape, specifications, appearance, etc. of the products listed in this catalog are subject to change or discontinuation without notice.

INDEX

MOTION GUIDE SYSTEMS

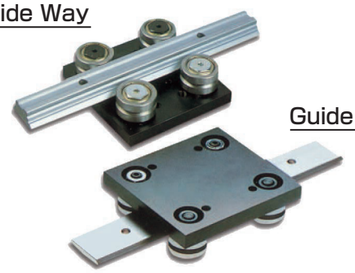
Track type
Realizing smooth conveying system, like a race track, by combination of Guide Ways and Ring Guide Ways.
Variable conveying system is available by using multiple carriage plates.

Guide Rail, Guide Way
Long guide system is also available by connecting multiple Guide Ways.

Swing type carriage
Swing type carriage enables it to clear curves of different curvatures.

Track type

Guide Way



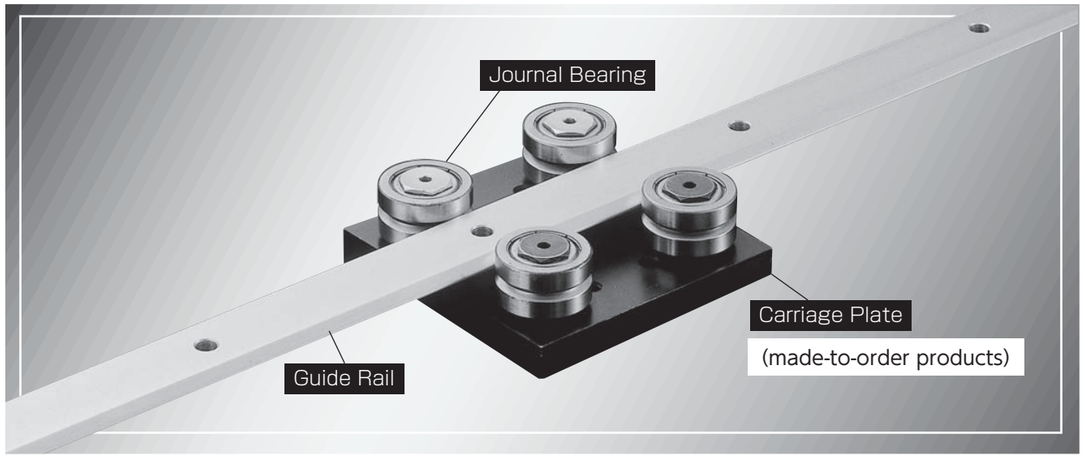
Guide Rail

Swing type Carriage

ASAHI Motion Guide Systems

for flexible design of conveying system

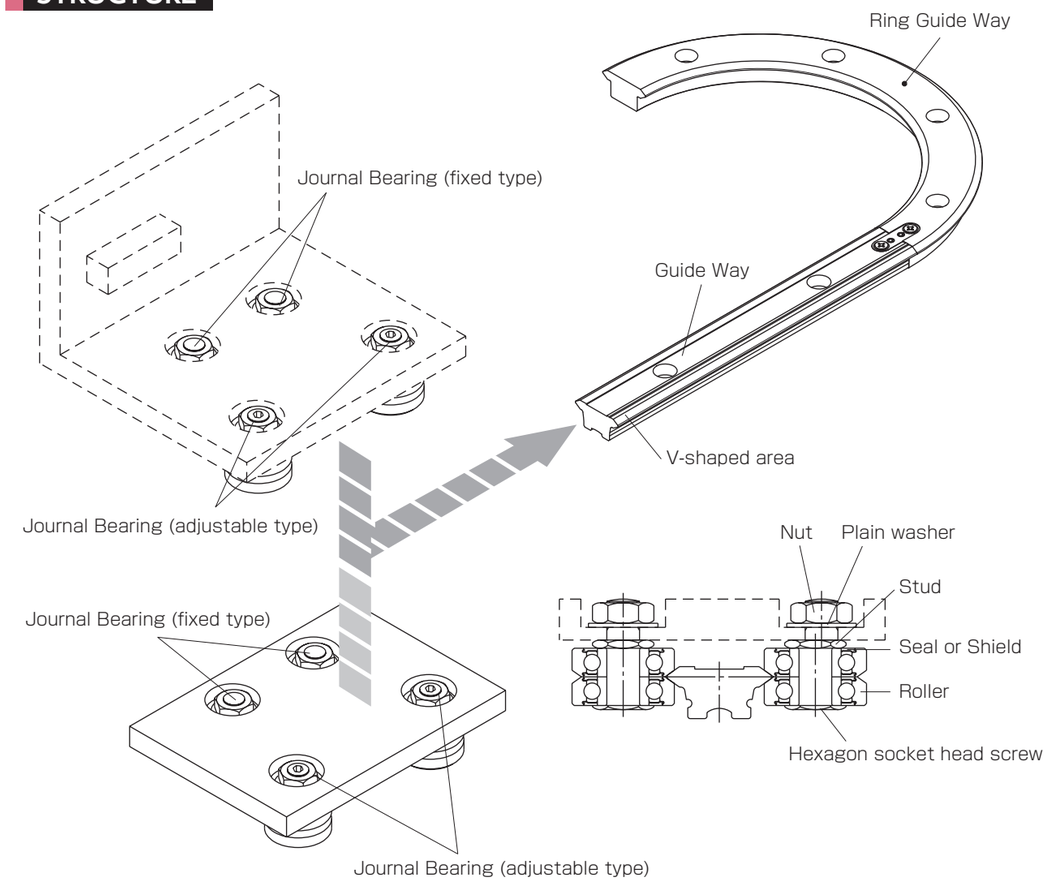
Motion Guide Systems provide smooth running of V-shaped journal bearings fitted on both sides of flat rail.Various combinations of components are available for machine designers' choice, to fit their specific applications, including curving movement.



FEATURES

- Flexible design and combination available to fit specific application
- Hard-Chromium-plated Rail surface, and hardened V-shaped race surface to roll-ing journal bearings
- Clearance easily adjustable between Rail and Journal Bearings
- Easy mounting and adjusting clearance

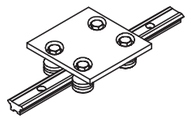
STRUCTURE

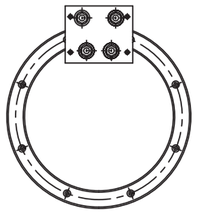


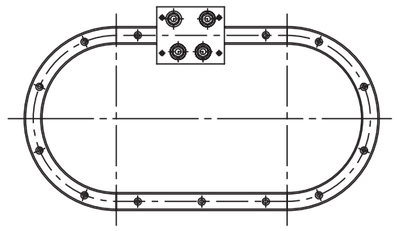
Combinations of Components

Wide range variation, either by unit or by components

Basic Assembly





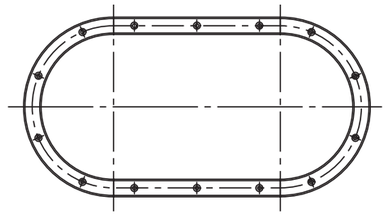


Reply to customer's request

〈Rail special specification products〉
Low temperature black chrome plate

Assembly Parts

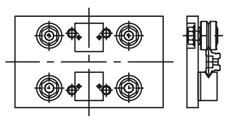
Rail Assembly



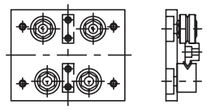
Track type

Carriage Assembly

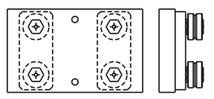
Straight type



Ring type



Swing type



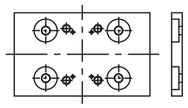
Components

Rail

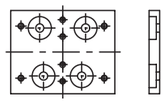
Straight	Guide Rail		AMR##A	AMR##	AMR##B
	Guide Way		AMR##W		
Ring	Ring Guide Way		AMR##C		

Carriage Plate

Straight type



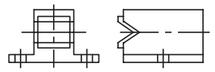
Ring type



Other Parts

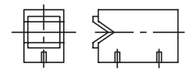
Lubricator

For Straight Rail



Flange type AML##F

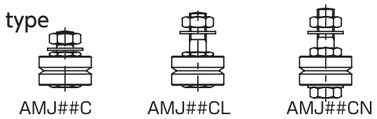
For Ring Rail
(Please consult us)



Compact type AML##C

Journal Bearing

Fixed type



AMJ##C
S-AMJ##C

AMJ##CL
S-AMJ##CL

AMJ##CN

Adjustable type

AMJ##E1
S-AMJ##E

AMJ##E1L
S-AMJ##EL

AMJ##E1N

Steel Shield type : As above
Rubber Seal type : Please add the suffix "-UU"
Stainless Series : Please add the prefix "S-"

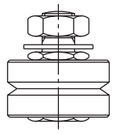
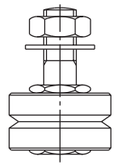
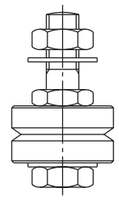
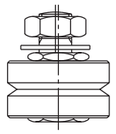
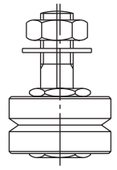
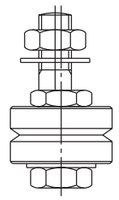
Variation

Assembly
- Rail Assembly
- Carriage Assembly

Components
- Rail — Straight / Ring / Other Special
- Carriage Plate — Other Special
- Journal Bearing — Plated / Dimensions

Reliable lineup with stable performance

Journal Bearing

	Short type	Long type	Lock nut type
Fixed type	 Material / Part number Standard type: AMJ##C, AMJ##C−UU Stainless type: S-AMJ##C, S-AMJ##C−UU	 Material / Part number Standard type: AMJ##CL, AMJ##CL−UU Stainless type: S-AMJ##CL, S-AMJ##CL−UU	 Material / Part number Standard type: AMJ##CN, AMJ##CN−UU
Adjustable type	 Material / Part number Standard type: AMJ##E1, AMJ##E1−UU Stainless type: S-AMJ##E, S-AMJ##E−UU	 Material / Part number Standard type: AMJ##E1L, AMJ##E1L−UU Stainless type: S-AMJ##EL, S-AMJ##EL−UU	 Material / Part number Standard type: AMJ##E1N, AMJ##E1N−UU

Note 1. ## means standard width of applicable rail; 12mm, 25mm, 44mm, 76mm.
※For the rail with the width of 12mm, please consult us in advance for availability.
2. Rubber seal type is identified by the suffix "-UU".
3. Refer to P.24 and 25 for mounting.

Attention: Any dust or scratch on the race surface may cause noise. Handle with care.

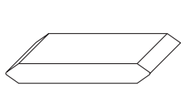
Rail

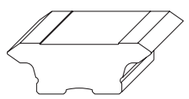
Types & Features

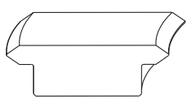
12 standard sizes are prepared, and the maximum length with mounting holes is 3956mm.
While V-shaped area is heat-treated to HRC50~58, the center area is left soft so that further machining is easy such as for drilling and tapping. Guide Ways and Ring Guide Ways can be connected longer if necessary.

Type	Features
Guide Rail	6 standard sizes
Guide Way	3 standard sizes, all in supporting-stand shape
Ring Guide Way	3 standard sizes, all in supporting-stand shape, with 7 different standard diameter 159~1033mm

Attention: Any dust or scratch on the race surface may cause noise. Handle with care.


Guide Rail


Guide Way

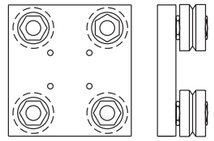

Ring Guide Way

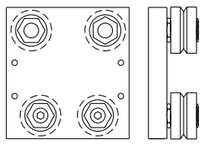
Carriage Plate (Made-to-order products)

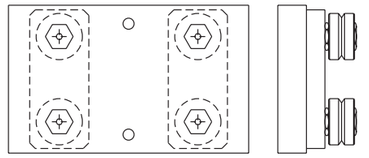
Types & applicable rail

Carriage Plate is an important part of the system, together with journal bearings and other components to be incorporated.Mounting holes for Lubricator are also pre-machined.

Type	Applicable Rail
Straight type	Straight rail (Guide Rail, Guide Way)
Ring type	Combination of Ring Guide Way curved for a same direction with a fixed curvature radius and in Combination with straight guide rail(Guide Way, Ring Guide Way)
Swing type	S-curve rail system of Guide Way and Ring Guide Way(Guide Way,Ring Guide Way)


Straight type

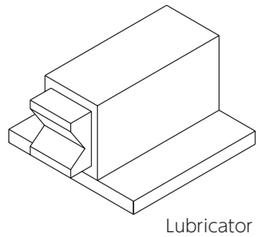

Ring type


Swing type

Lubricator (optional)

Application & Features

Lubricator can be mounted to a carriage plate to contact with the rail's V-shaped surface during running operation to feed sufficient lubricant and wipe away foreign substances, so that it increases the load carrying capacity and service life as well as the maximum speed of journal bearings. Shell Tonna Oil is recommended for motion guide systems.


Lubricator

⚠ ATTENTION

- Depending on rail condition, there may be caused uniformed running torque.
- Please use shim or such materials to adjust height of rails' connecting area as necessary.
- There may be found uneven color between components due to difference of material composition and/or surface treatment.
- Do not use the systems under the circumstances where there may be adverse effects to the products, such as outdoor, splash of fresh water, solutions or oil, vibration or dust,etc.

Technical Guide

Rail

Guide Rail, Guide Way

Material ▶ Guide Rail---SCM435 Chrome molybdenum steel equivalent
▶ Guide Way--- SMn455 Manganese steel equivalent
V-shaped area hardness ▶ HRC50～58 **V-shaped angle** ▶ 70°
Straightness ▶ 1m or less: 0.3mm, 2m or less: 0.6mm, 3m or less: 0.9mm, 4m or less: 1.2mm
Parallelness ▶ 1m or less: 0.3mm, 2m or less: 0.6mm, 3m or less: 0.9mm, 4m or less: 1.2mm
Tolerance of mounting holes pitch ▶ ±0.2mm(Accuracy after mounting=non-accumulative)
The tolerance of holes pitch is not the accumulated value, but the value between each holes pitch.If necessary please specify proper pitch dimension or oval hole size and positions at the time of order, or the pitch will be processed according to our standard dimension. Those expense for customer's order of mounting holes will be quoted.
Surface roughness of V-shaped area ▶ Ra3.2
Surface treatment ▶ Hard-Chromium plated (excluding cut surfaces of both ends and drilled holes)

Ring Guide Way

Material ▶ SCM435 equivalent or S45C
V-shaped area hardness ▶ HRC50～58 **V-shaped angle** ▶ 70°
Tolerance of mounting hole angle ▶ ±0.2°(Accuracy after mounting)
Surface roughness of V-shaped area ▶ Ra3.2
Surface treatment ▶ Hard-Chromium plated (excluding cut surfaces of both ends and drilled holes)

Tolerances for Rail connection

Part number of the connectable Guide Way and Ring Guide Way carries prefix "T-" e.g. T-AMR25WXL
The connectable Guide Way and Ring Guide Way are machined to assemble in the following tolerances:
※At connecting area, rail width does not conforms to the specification since levels of V-shaped surfaces are adjusted to meet, but the system runs with no problem by the recommended pre-load values on P.25.
Gap ▶ 0.3mm or less
Difference in level of V-shaped surfaces ▶ 0.02mm or less
Note: There appears a gap at connected point of straight and ring portions due to its structure when the system runs.

Unit:mm

Carriage Plate No.	AMP25C×255	AMP25C×351	AMP44C×468	AMP44C×612	AMP76C×799	AMP76C×1033
Width of straight rail	25		44		76	
Diameter of Ring Guide Way	255	351	468	612	799	1033
Maximum width gap between rail and journal bearing	0.18	0.09	0.21	0.21	0.13	0.19

※Theoretical value

Journal Bearing

Standard Series

Material **Roller** ▶ SUJ(Bearing steel)Hardness HRC60～64
※Standard material for AMJ12 is SUS Stainless Steel
Shield ▶ SPCC(Shield type)
※For AMJ76 Shield type, rubber seal is used to V-shaped side and shield to the other.
Seal ▶ NBR (Rubber seal type)
Stud, Nut ▶ S45C
Plain Washer ▶ SS400 **Hex socket screw** ▶ SCM435
Lubricant ▶ Shell Alvania Grease S3
Operating Temperature Range ▶ -20℃～120℃

Stainless Series

Material **Roller** ▶ SUS440C equivalent
Stud and other parts ▶ SUS303,SUS304 including Shield, Nut, etc.
※For S-AMJ76 Shield type, rubber seal is used to V-shaped side and shield to the other.
Lubricant ▶ Food Grade Grease
Operating Temperature Range ▶ -20℃～120℃
Maximum Operating Speed ▶ Without lubricator, 1.5m/sec
With lubricator, 2m/sec

Carriage Plate

(Made-to-order products)

Material ▶ Aluminum Alloy
Surface treatment ▶ Black Anodic Oxide coating

※There may be color difference between components due to material composition and surface treatment.
※Specification is subject to change without prior notice.

Model List

Rail

Type/Size	Part Number		
	25	44	76
Guide Rail	AMR25×L	AMR44×L	AMR76×L
	AMR25A×L	AMR44A×L	–
	–	–	AMR76B×L
Guide Way	AMR25W×L	AMR44W×L	AMR76W×L
Ring Guide Way	AMR25C×159(A,B,C)	AMR44C×468(A,B,C)	AMR76C×799(A B C)
	AMR25C×255(A B C)	AMR44C×612(A,B,C)	AMR76C×1033(A,B,C)
	AMR25C×351(A,B,C)		

Note 1. Put total length of rail in place of symbol "L" in mm (See P.19).
2. Suffixes “A”, “B” and “C” in the above Ring Guide Way's part numbers mean the rings arc degree; 360°, 180°, 90°, respectively.
3. See P.18 and 19 for length and other rail dimensions.
4. Above part numbers of Guide Rail and Guide Way represent only standard series, not for connection.
5. For connection, prefix "T-" should be added to the part number (See P.14 and P.16).

Journal Bearing

Type/Size	Part Number				Fix/Adjust	Sealing
	12	25	44	76		
Short type	AMJ12C	AMJ25C	AMJ44C	AMJ76C	Fixed	Shield
	AMJ12E1	AMJ25E1	AMJ44E1	AMJ76E1	Adjustable	
	—	AMJ25C-UU	AMJ44C-UU	AMJ76C-UU	Fixed	Rubber Seal
	—	AMJ25E1-UU	AMJ44E1-UU	AMJ76E1-UU	Adjustable	
Long type	AMJ12CL	AMJ25CL	AMJ44CL	AMJ76CL	Fixed	Shield
	AMJ12E1L	AMJ25E1L	AMJ44E1L	AMJ76E1L	Adjustable	
	—	AMJ25CL-UU	AMJ44CL-UU	AMJ76CL-UU	Fixed	Rubber Seal
	—	AMJ25E1L-UU	AMJ44E1L-UU	AMJ76E1L-UU	Adjustable	
Lock nut type	AMJ12CN	AMJ25CN	AMJ44CN	AMJ76CN	Fixed	Shield
	AMJ12E1N	AMJ25E1N	AMJ44E1N	AMJ76E1N	Adjustable	
	—	AMJ25CN-UU	AMJ44CN-UU	AMJ76CN-UU	Fixed	Rubber Seal
	—	AMJ25E1N-UU	AMJ44E1N-UU	AMJ76E1N-UU	Adjustable	

Note 1. Each Journal Bearing size number; 12mm, 25mm, 44mm, 76mm shall fit to the same rail width 12mm, 25mm, 44mm, 76mm, respectively.
※ For the rail width of 12mm, please consult us in advance for availability.
2. Symbol "C" is used for fixed type, and "E1" for adjustable type.
3. Dimensions are shown on P.22.
4. Stainless series are also available. Please refer to P.22 for details.

Carriage Plate (Made-to-order products)

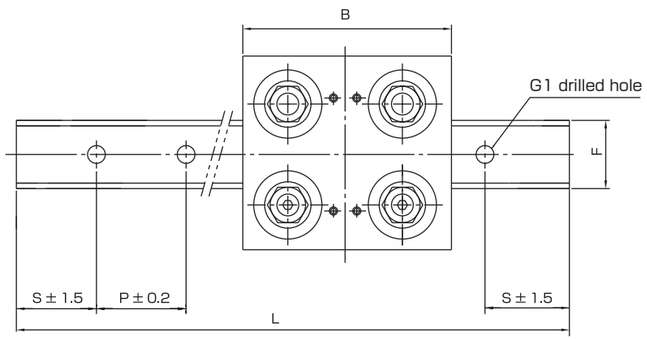
Type/Size	Part Number			
	12	25	44	76
Straight type	AMP12(A,B,C)	AMP25(A,B,C)	AMP44(A,B,C)	AMP76(A,B,C)
	–	AMP25A(A,B,C)	AMP44A(A,B,C)	–
Ring type	–	AMP25C×159	AMP44C×468	AMP76C×799
	–	AMP25C×255	AMP44C×612	AMP76C×1033
		AMP25C×351		
Swing type	–	AMS25	AMS44	AMS76

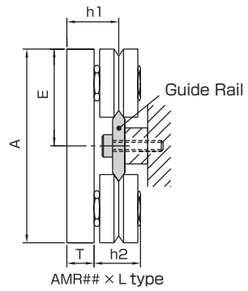
Note : Dimensions are shown on P.20 and P.21.

Dimensions Straight type

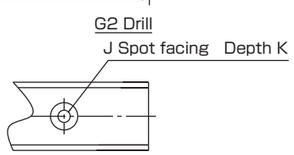
Straight type Features

Widely used straight type at every scene.
Long guide system becomes available by connecting Guide Ways.

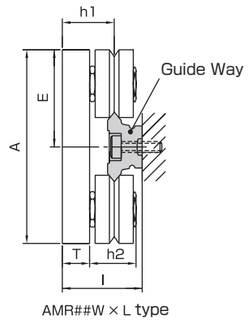




AMR## × L type

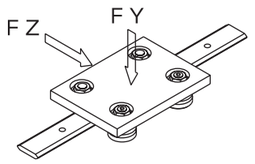


AMR##W × L type

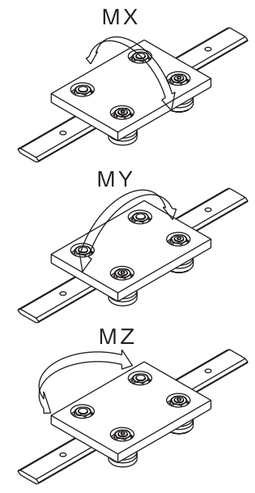


AMR##W × L type

Load direction



Moment direction



Numbering System - Straight type

〈Example〉

AM 25 W × 6000 - PA 2 L

- AM: Symbol of ASAHI Motion Guide Set
- 25: Rail width (25, 44, 76 in mm)
- W: Rail type — No indication : Guide Rail; W : Guide Way
- 6000: Total rail length (mm)
- PA: Length of carriage plate (See "B" dimension below) — PA Short, PB Medium, PC Long
- 2: Numbers of carriage Assembly (See below)
- L: Lubricator — No indication if not necessary

■ Performance Table of Carriage Assembly

Note: Carriage Assembly consists of a carriage plate and journal bearings mounted, and is shown by suffix "JX"

Carriage Assembly number	Allowable Load (N)		Allowable Moment (Nm)			Weight (g)
	FY	FZ	MX	MY	MZ	
AMP25AJX	1764	882	22.7	44.1	22.1	340
AMP25BJX				61.7	30.9	448
AMP25CJX				105.8	52.9	556
AMP44AJX	3136	1568	70.1	133.3	66.6	983
AMP44BJX				156.8	78.4	1216
AMP44CJX				235.2	117.6	1449
AMP76AJX	7056	3528	270.7	493.9	247.0	3332
AMP76BJX				705.6	352.8	4231
AMP76CJX				1058.4	529.2	5131

■ Straight type - Motion Guide Set

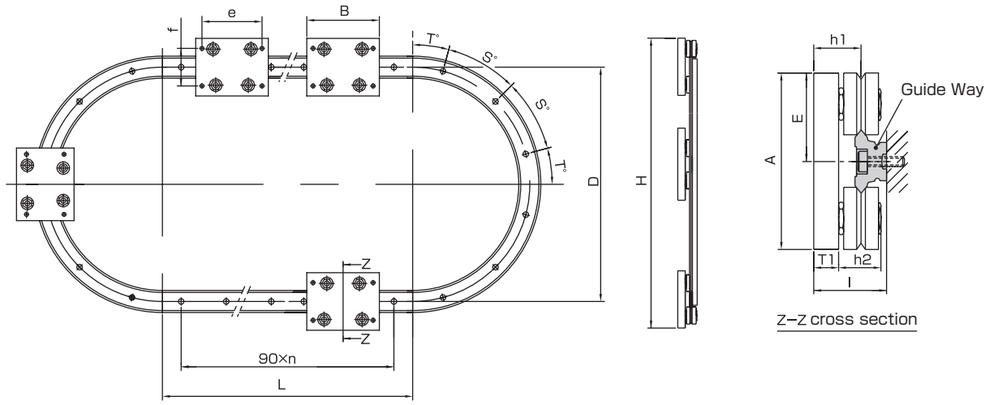
Unit:mm

Set Number	Components			Dimensions													
	Guide Rail/Way	Journal Bearing	Carriage Plate	A	B	E	F	G1	(G2)	(J)	(K)	L	S	P	h1	h2	T	(l)
AM25 × L-P(A,B,C)	AMR25 × L	AMJ25C	AMP25A	80	80	40	25	6.5	5.5	10	5.5	266～3956	43	90	19	17	10	29
			AMP25B		130													
AM25W × L-P(A,B,C)	T-AMR25W × L	AMJ25E1	AMP25C		180													
AM44 × L-P(A,B,C)	AMR44 × L	AMJ44C	AMP44A	115	125	57.5	44	6.5	7	11	6.5	266～3956	43	90	26.5	22.5	15	39
			AMP44B		175													
AM44W × L-P(A,B,C)	T-AMR44W × L	AMJ44E1	AMP44C		225													
AM76 × L-P(A,B,C)	AMR76 × L	AMJ76C	AMP76A	185	200	92.5	76	10.5	14	20	12.5	446～3956	43	90	37	35	18	56.5
			AMP76B		300													
AM76W × L-P(A,B,C)	T-AMR76W × L	AMJ76E1	AMP76C		400													

Note
1. Maximum length per rail is 3956mm. Please connect Guide Ways for longer length.(Guide Rail cannot be connected.) But long rails such as 3956mm cannot be machined keyway processing.
2. No-mounting hole types are prepared.If you machine mounting holes by yourselves, please so designate when ordering.
3. Put total length in mm in place of symbol "L" .
4. Suffixes "A", "B" and "C" mean sizes of carriage plate, respectively.See dimension table on P.20 and P.21.
5. Please order in mm for the rail length "L" within the range shown on the above.
6. Maximum length of no-mounting hole types is 4020mm.
7. Prefix "T-" means that Guide Way is already machined to be connected. Machining expense for connection shall be quoted separately.
8. The dimensions "G2", "J", "K" and "l" are for Guide Way only.
9. Please follow assembly manual on P.24 and P.25 and make necessary adjustment before start using the system.

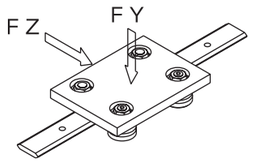
Track type Features

Track type for space saving to your needs. Connection of straight rail to curved rail is realized.

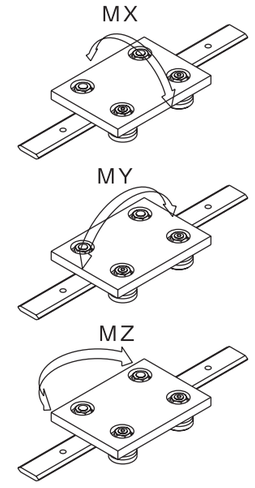


※At connecting area, rail width does not conform to the specification since levels of V-shaped surfaces are adjusted to meet, but the system runs with no problem by the recommended pre-load values on P.25.

Load direction



Moment direction



Numbering System - Track type

〈Example〉

AM 25 T × 6000 - 255 B P 2 L

- AM: Symbol of ASAHI Motion Guide Set
- 25: Rail width (25, 44, 76 in mm)
- T: Rail type — T: Track type, connected
- 6000: Total length of straight rail (mm)
- 255: Ring diameter
- B: Angle of Ring Guide Way (B:180°)
- P: Carriage Plate
- 2: Numbers of carriage assembly(See below)
- L: Lubricator — No indication if not necessary

■ Performance Table of Carriage assembly

Note: Carriage Assembly consists of a carriage plate and journal bearings mounted, and is shown by suffix "JX"

Carriage Assembly number	Allowable Load (N)		Allowable Moment (Nm)			Weight (g)
	FY	FZ	MX	MY	MZ	
AMP25C×159JX	1764	882	22.7	41.9	20.9	372
AMP25C×255JX				38.7	19.4	383
AMP25C×351JX				40.3	20.2	394
AMP44C×468JX	3136	1568	70.1	119.2	59.6	1033
AMP44C×612JX				123.6	61.8	1055
AMP76C×799JX	7056	3528	270.7	369.0	184.5	3242
AMP76C×1033JX				435.7	217.9	3422

■ Track type - Motion Guide set

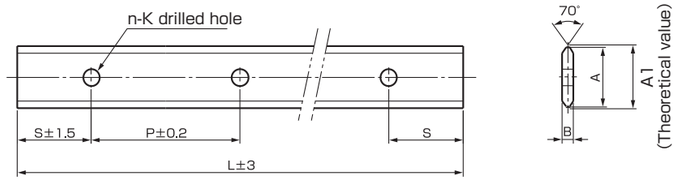
Unit:mm

Set Number	Components				Dimensions													
	Guide Way	Ring Guide Way	Carriage Plate	Journal Bearing	L	D	H	e	f	S	T	A	B	E	h1	h2	T1	l
AM25T×L-159BP(L)	T-AMR25W×L	T-AMR25C×159B	AMP25C×159	AMJ25C AMJ25E1	266～	159	239	80	50	45	22.5	80	95	40	19	17	10	29
AM25T×L-255BP(L)		T-AMR25C×255B	AMP25C×255			255	335						100					
AM25T×L-351BP(L)		T-AMR25C×351B	AMP25C×351			351	431	85		30	15		105					
AM44T×L-468BP(L)	T-AMR44W×L	T-AMR44C×468B	AMP44C×468	AMJ44C AMJ44E1	266～	468	583	120	75	30	15	115	145	57.5	26.5	22.5	15	39
AM44T×L-612BP(L)		T-AMR44C×612B	AMP44C×612			612	727	125		22.5	11.25		150					
AM76T×L-799BP(L)	T-AMR76W×L	T-AMR76C×799B	AMP76C×799	AMJ76C AMJ76E1	446～	799	984	160	100	22.5	11.25	185	190	92.5	37	35	18	56.5
AM76T×L-1033BP(L)		T-AMR76C×1033B	AMP76C×1033			1033	1218	180		18	9		210					

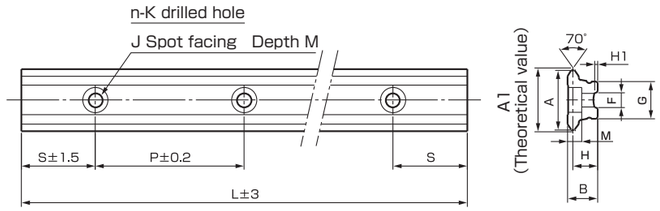
Note
1. Maximum length per rail is 3956 mm when connecting straight rail.
2. Put total length of rail in mm in place of symbol "L".
3. The prefix "T-" means that Guide Way/Ring Guide Way is pre-machined to be connected. Machining expense for connection shall be quoted separately.
4. Please follow assembly manual on P.24 and P.25 and make necessary adjustment before starting the system run.
5. If you machine mounting holes by yourselves, please so designate when ordering.

Dimensions Guide Rail, Guide Way, Ring Guide Way

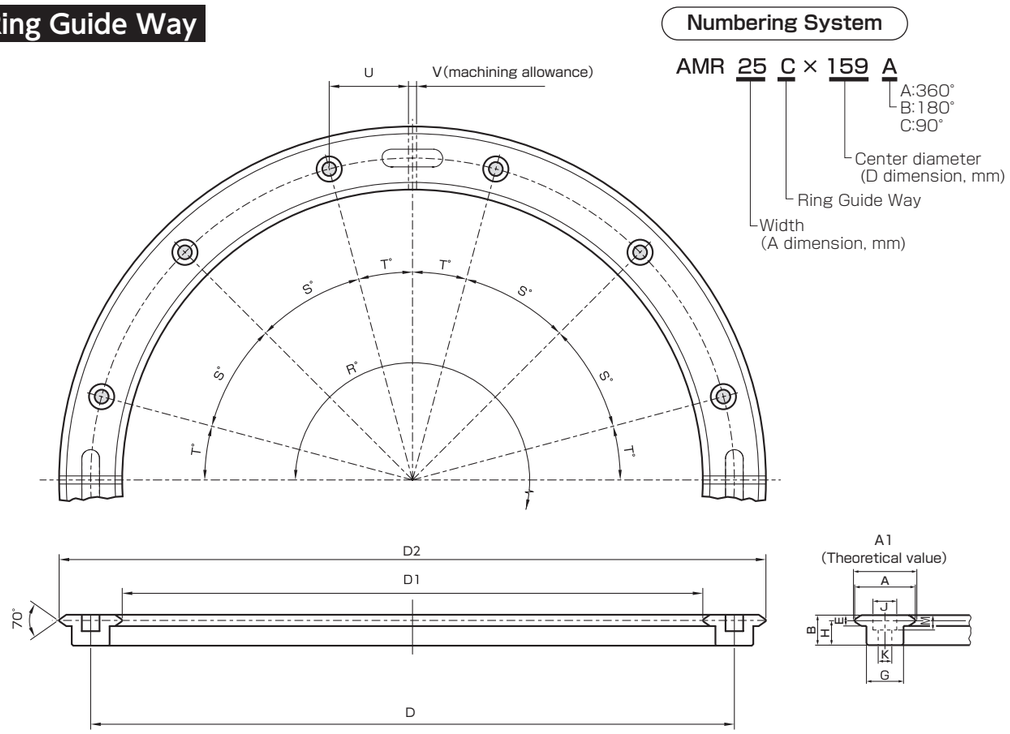
Guide Rail



Guide Way



Ring Guide Way



■ Guide Rail

Part Number	Dimensions(mm)							Nos. of holes n	Mounting Bolt	Wt. kg/m
	A	A1 (Theoretical value)	B	K	S	P	L			
AMR25 × L	25	25.74	4.5	6.5	43	90	See length and numbers of mounting holes below		M6	0.8
AMR25A × L	25.5	26.58	5	5.5					M5	0.9
AMR44 × L	44	44.74	6	6.5					M6	1.9
AMR44A × L	44.5	45.88	6.5	7					M6	2.1
AMR76 × L	76	76.74	9	10.5					M10	5
AMR76B × L	76	76.74	6	6.5					M6	3.4

Note: Put total length of rail in mm in place of symbol "L".

■ Guide Way

Part Number	Dimensions(mm)													Nos. of holes n	Mounting Bolt	Wt. kg/m
	A	A1 (Theoretical value)	B	G	H	F	H1	J	K	M	S	P	L			
AMR25W × L	25	25.74	12.25	15	10	6	1.3	10	5.5	5.5	43	90	See length and numbers of mounting holes below		M5	1.6
AMR44W × L	44	44.74	15.5	26	12.5	8	1.3	11	7	6.5					M6	3.7
AMR76W × L	76	76.74	24	50.5	19.5	20	1.3	20	14	12.5					M12	10.6

Note: Put total length of rail in mm in place of symbol "L".

■ Length of rail and numbers of mounting holes, applicable to both Guide Rail and Guide Way

Total length(mm)	176	266	356	446	536	626	716	806	896	986	1076	1166
Nos. of holes n	2	3	4	5	6	7	8	9	10	11	12	13
Total length(mm)	1256	1346	1436	1526	1616	1706	1796	1886	1976	2066	2156	2246
Nos. of holes n	14	15	16	17	18	19	20	21	22	23	24	25
Total length(mm)	2336	2426	2516	2606	2696	2786	2876	2966	3056	3146	3236	3326
Nos. of holes n	26	27	28	29	30	31	32	33	34	35	36	37
Total length(mm)	3416	3506	3596	3686	3776	3866	3956					
Nos. of holes n	38	39	40	41	42	43	44					

Note: Maximum length available is 4020mm if mounting holes are not necessary.

■ Ring Guide Way

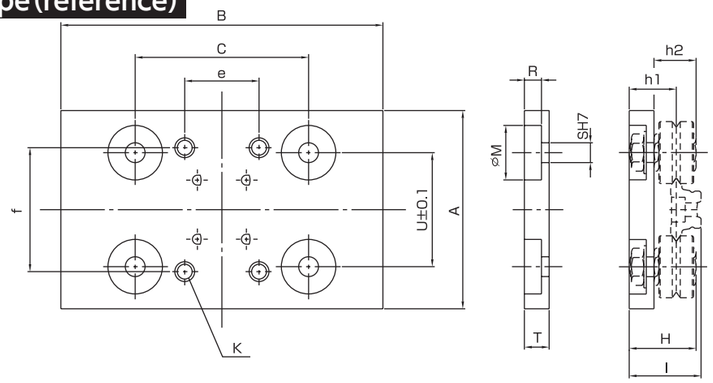
Part Number	Dimensions(mm)																		Nos. of holes R=360°	Wt. (kg) R=360°
	D±0.2	D2	D1	A	A1 (Theoretical value)	B	G	H	E	J	K	M	R°			S°±0.2	T°	U	V		
AMR25CX159(A,B,C)	159	184	134	25	25.74	12.25	15.4	10	4.5	9.5	5.5	6	90	180	360	45	22.5	29.4	1	8	0.77
AMR25CX255(A,B,C)	255	280	230															47.8			1.2
AMR25CX351(A,B,C)	351	376	326													30	15	44.4		12	1.65
AMR44CX468(A,B,C)	468	512	424	44	44.74	15.5	26	12.5	6	11	6.8	7						58.6	2		5.1
AMR44CX612(A,B,C)	612	656	568													22.5	11.25	57.7		16	6.7
AMR76CX799(A,B,C)	799	875	723	76	76.74	24	50.5	19.5	9	20	14	13						75.9			25
AMR76CX1033(A,B,C)	1033	1109	957													18	9	78.8		20	32

Note
1. Suffixes "A","B", and "C" to part number show the angles of cut-off Ring Guide Way, as A:360°, B:180°, C:90°.
2. As to 360°type Ring Guide Way, there is a narrow soft zone on V-shaped area.

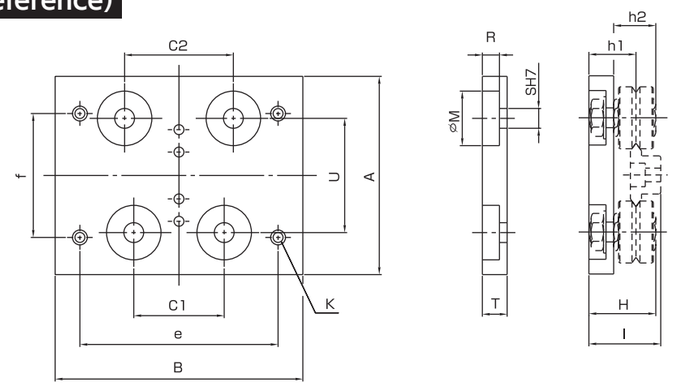
Dimensions Carriage Plate (made-to-order products)

Carriage plates are primarily productions to order and will be quoted if you order the plates separately.Also,these dimensions will be for your reference when you prepare the plates by yourself.

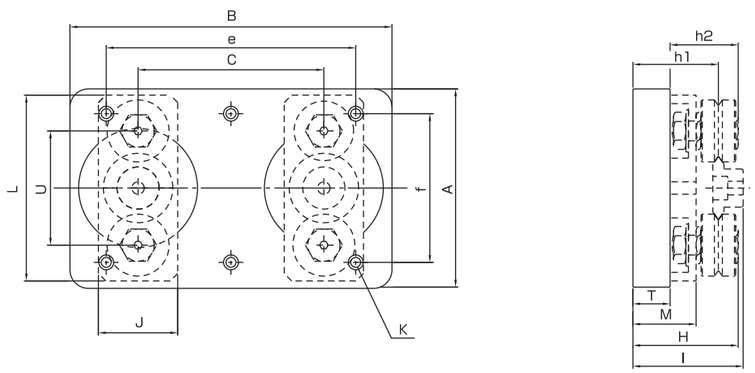
Straight type (reference)



Ring type (reference)



Swing type (reference)



■ Straight type Carriage Plate

Part Number	Journal Bearings applicable	Rail applicable (Guide Rail/Way)	Dimensions (mm)																Wt. (g)
			U±0.1	C	A	B	T	R	M	S	f	e	K	H	I	h1	h2	
AMP12A	AMJ12 type	(※AMR12×L)	22	35	40	50	6	3.5	12.5	4	25	–	M4	16.5	–	11.5	10.5	27
AMP12B				60		75						25						43
AMP12C				85		100						50						59
AMP25A	AMJ25 type	AMR25×L	46	50	80	80	10	6.9	22	8	50	18	M6	27	29	19	17	140
AMP25B				70		130						30						248
AMP25C		AMR25W×L		120		180						50						356
AMP44A	AMJ44 type	AMR44×L	72	85	115	125	15	8.5	25	10	75	48	M8	37	39	26.5	22.5	523
AMP44B				100		175						50						756
AMP44C		AMR44W×L		150		225						50						989
AMP76A	AMJ76 type	AMR76×L	119	140	185	200	18	11.5	32	14	125	60	M10	53	56.5	37	35	1672
AMP76B		AMR76B×L		200		300						80						2571
AMP76C		AMR76W×L		300		400						180						3471
AMP25AA	AMJ25 type	AMR25A×L	47	50	80	80	10	6.9	22	8	50	18	M6	27	29	19	17	140
AMP25AB				70		130						30						248
AMP25AC				120		180						50						356
AMP44AA	AMJ44 type	AMR44A×L	73	85	115	125	15	8.5	25	10	75	48	M8	37	39	26.5	22	523
AMP44AB				100		175						50						756
AMP44AC				150		225						50						989

Note: Put total length of rail in mm in place of symbol“L”
※AMR12 with rail width 12mm is available to order.

■ Ring type Carriage Plate

Part Number	Journal Bearings applicable	Ring Guide Way applicable	Dimensions (mm)																Wt. (g)
			U	C1	C2	A	B	T	R	M	S	f	e	K	H	I	h1	h2	
AMP25C×159	AMJ25 type	AMR25C×159(A,B,C)	46.1	35	47.5	80	95	10	6.9	22	8	50	80	M6	27	29	19	17	172
AMP25C×255		AMR25C×255(A,B,C)		36.5	43.9		100						80						183
AMP25C×351		AMR25C×351(A,B,C)		40	45.7		105						85						194
AMP44C×468	AMJ44 type	AMR44C×468(A,B,C)	71.9	65	76.0	115	145	15	8.5	25	10	75	120	M8	37.5	39	26.5	22.5	573
AMP44C×612		AMR44C×612(A,B,C)		70	78.8		150						125						595
AMP76C×799	AMJ76 type	AMR76C×799(A,B,C)	118.7	90	104.6	185	190	18	11.5	32	14	100	160	M10	53	56.5	37	35	1582
AMP76C×1033		AMR76C×1033(A,B,C)		110	123.5		210						180						1762

■ Swing type Carriage Plate

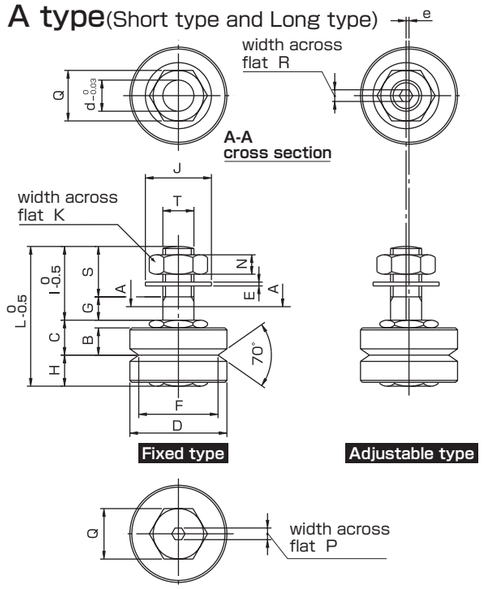
Part Number	Journal Bearings applicable	Rail applicable Guide Way/ (Ring Guide Way)	Dimensions (mm)															Wt. (g)
			B	A	H	I	U	C	e	f	K	J	L	T	M	h1	h2	
AMS25	AMJ25 type	AMR25 type	130	80	42.5	44.5	46.1	75	90	60	M6×1	32	75	15	25.5	34.5	27.5	800
AMS44	AMJ44 type	AMR44 type	175	115	54.5	56.5	71.9	100	125	85	M8×1.25	38	105	18	32.5	44.0	36.5	2100
AMS76	AMJ76 type	AMR76 type	※Please consult us for availability															

Note: Swing type carriage plate is applicable to S-shaped curve or track type system in combination with different curve radius.This is also suitable when much stable travel performance is required.

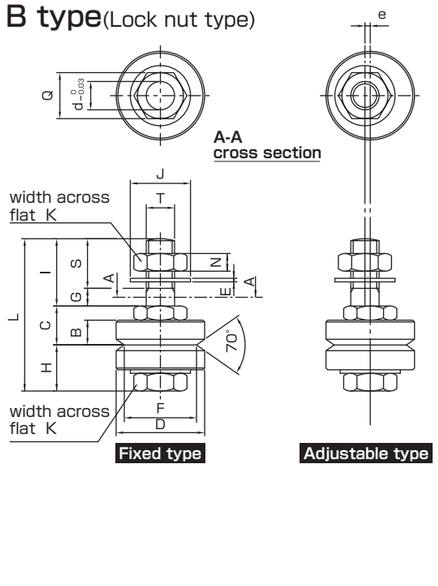
Dimensions Journal Bearings

Standard Series　Stainless Series

A type(Short type and Long type)



B type(Lock nut type)



■ Journal Bearings Dimensions

Part Number		type	Dimensions(mm)																		Wt. (g)	Max. Allowable Load(N)	Tightening Torque (Ncm)
Standard Series	Stainless Series		L	B	C	H	I	D	F	d	T	S	G	Q	E	J	N	K	P	R	e			
AMJ12C	S-AMJ12C	A	16.5	4	5.5±0.2	5	6	12.7	9.63	4	M4×0.5	3.5	2.5	8	0.8	9	2.4	7	–	–	0	8	98	166
AMJ12E1	S-AMJ12E																				0.5(1.3)			
AMJ12CL	S-AMJ12CL		20				9.5					7	2.5								0	9		
AMJ12E1L	S-AMJ12EL																				0.5(1.3)			
AMJ12CN	–	B	22		7.13	7.2	8				M4×0.7	4.8	3.2				3	8	–	–	0	11	98	147
AMJ12E1N																					0.5			
AMJ25C	S-AMJ25C	A	27	7	9±0.2	8	10	25	20.4	8	M8×1.0	6.5	3.5	13	1.0	17	5	13	3	0	0	50	441	1293
AMJ25E1	S-AMJ25E																			3	0.75(2.0)			
AMJ25CL	S-AMJ25CL		36				19					13	6							0	0	53		
AMJ25E1L	S-AMJ25EL																			3	0.75(2.0)			
AMJ25CN	–	B	43		11	13	19					14	5						–	–	0	60	441	1294
AMJ25E1N																					1.5			
AMJ44C	S-AMJ44C	A	36.5	9	11.5±0.2	11	14	34	27.17	10	M10×1.25	8	6	17	1.2	21	6	17	4	0	0	115	784	2508
AMJ44E1	S-AMJ44E																			4	1.0(2.5)			
AMJ44CL	S-AMJ44CL		44.5				22					15	7							0	0	120		
AMJ44E1L	S-AMJ44EL																			4	1.0(2.5)			
AMJ44CN	–	B	52		13	18	21					15	6						–	–	0	140	784	2538
AMJ44E1N																					1.5			
AMJ76C	S-AMJ76C	A	53	14	19±0.2	16	18	54	42	14	M14×1.5	11	7	27	1.5	28	8	22	8	0	0	415	1764	7134
AMJ76E1	S-AMJ76E																			6	1.5(4.5)			
AMJ76CL	S-AMJ76CL		65				30					21	9							0	0	430		
AMJ76E1L	S-AMJ76EL																			6	1.5(4.5)			
AMJ76CN	–	B	74		22	24	28					17	11						–	–	0	550	1764	7134
AMJ76E1N																					2.7			

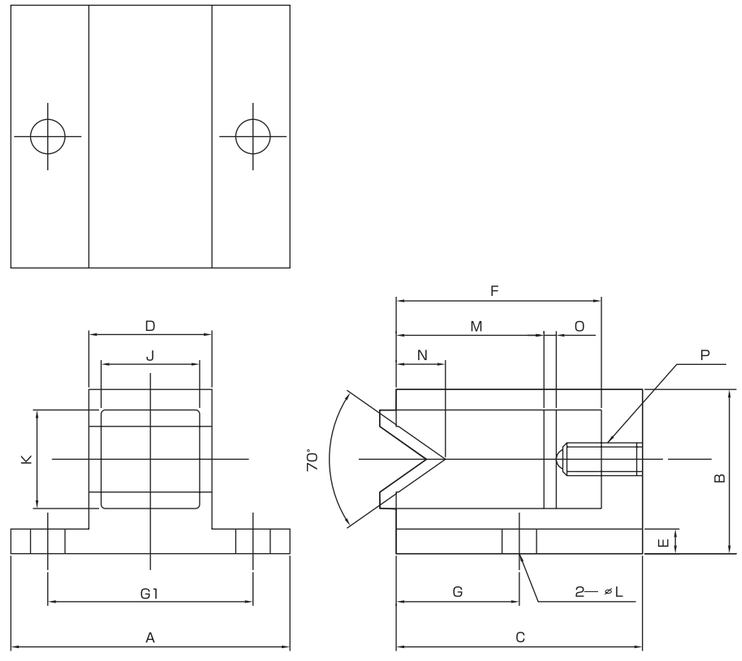
Note 1. "F" is diameter of V-contacting points.
2. The figures in ( ) of "e" dimension are for stainless steel journal bearings.
3. Journal bearings with seal is also available except AMJ12 series, and please add suffix "-UU" for order.

Dimensions (optional)Lubricator

Lubricator

Covered in shock-resistant plastic case, Lubricator has oil-contained felt wiper, which spreads lubricant film on V-shaped surface of rail.This also prevents wear of rail, and significantly increases load capacity and life of the system.

Attention: Please consult us as dimensions have to be re-examined depending on application condition.



■ Lubricator for straight rail

Part Number	Application		Dimensions(mm)													
	Journal Bearing	Guide Rail/Way	A	B	C	D	E	F	G	G1	J	K	L	M	N	O	P
AML25 F	AMJ25C(L) AMJ25E1(L)	AMR25 type	25	16.5	25	10	2	20	12.5	18	7	7	3.2	16	5	1	M4
AML44 F	AMJ44C(L) AMJ44E1(L)	AMR44 type	34	20	30	15	2.4	25	15	25	12	12	4.2	18	6	1	M4
AML76 F	AMJ76C(L) AMJ76E1(L)	AMR76 type	48	33	57	22	5	44	26	38	15	15	5.5	30	11	1.6	M5

Note 1. Lubricator for Ring Guide is also available.Please consult us.
2. For Swing Type Carriage, Lubricator is not available.
3. Please consult us for Lubricator for carriage plate AMP25A and AMP25AA.

Assembly Manual

1.Journal Bearings to Carriage Plate

As shown on a sketch below, please mount fixed type (AMJ##C or S-AMJ##C type) Journal Bearings to one side of Carriage Plate, and adjustable type (AMJ##E1 or S-AMJ##E type) to the other, following the direction of rail.In case of Ring type carriage plate, the fixed type bearings should be mounted to the side where mounting-hole distance is shorter.

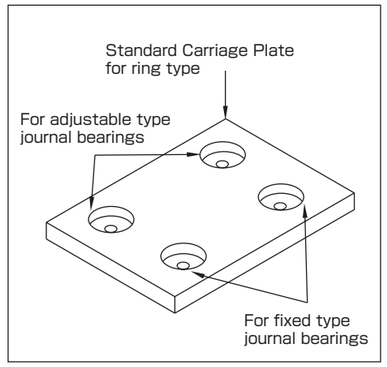
2.Mounting to rail

Journal bearings AMJ##E1 type (with smaller eccentricity)

Carriage Assembly shall be mounted to rail from the rail end.

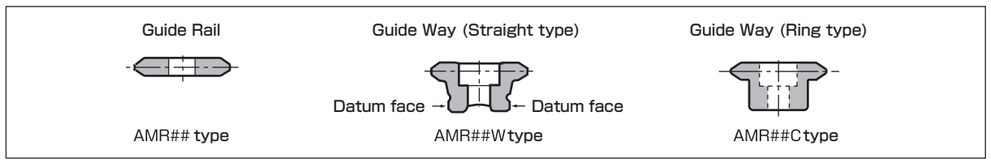
Journal bearings S-AMJ##E type (with bigger eccentricity)

Carriage Assembly can be mounted to rail either from the rail end or if possible from the upside of the rail.



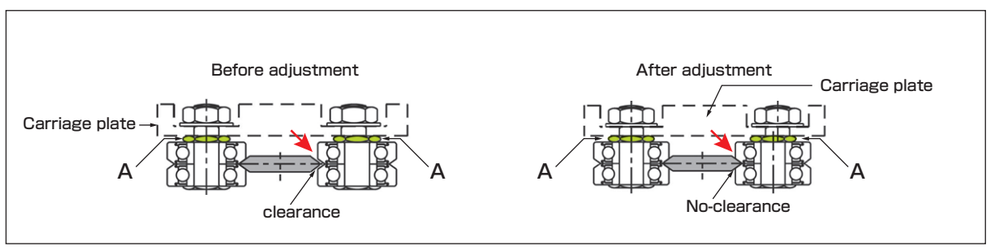
Note

1. Please do not put any overstress when mounting.
2. In case of Guide Way, please choose either side of supporting portion as datum face, and set the fixed type bearings at the datum-face side.
3. Please use mounting surface of machine frame which is kept at Ra 3.2 or less .



3.Clearance between Journal Bearings and Rail

Please turn the hexagonal two-face width of stud shaft (part A in the figure below) of adjustable journals with a hexagon spanner so that both ends of the rail width meet the V-shaped groove of the journal bearings and there is no-clearance.While holding the hex spanner in place with no-clearance, please use a hexagon socket wrench to tighten the mounting hex nuts at the tightening torque value on page 22.



※Please watch the installation video from the QR code.

For Mothion Guide Ring type ➡

4.Careful attention to clearance adjustment

Standard carriage assembly

Please fix a carriage plate and rotate only journal bearings by hands, and adjust to the extent where there causes a slight slipping resistance with rail.After then, please adjust to the condition where moving power becomes the recommended value shown below, by putting load by push-pull gauge to the running direction of carriage plate, and all 4 Journal Bearings are rotating.

Appropriate pre-load applied by fastening adjustable bearings leads to "no-clearance" status between Journal Bearings and rail, which provides more rigidity of the system. However, over pre-load may cause decreasing service life of the bearings,so please pay careful attention.

■ Recommended pre-load by push-pull gauge (1set)

Journal Bearing size	Pre-load(N)	Journal Bearing size	Pre-load(N)
AMJ12 type	0.8～3.2	AMJ44 type	2～8
AMJ25 type	1～4	AMJ76 type	3～12

Note: As to 360°type Ring Guide Way, there is a narrow soft zone on V-shaped area.

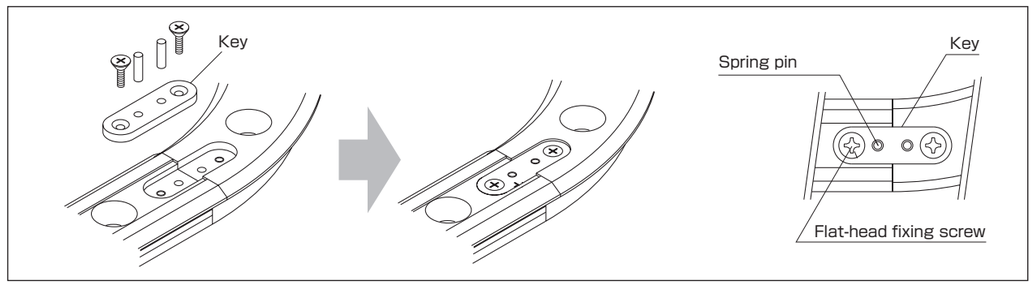
Swing carriage assembly

Swing carriage assembly will be supplied after mounting bearings to carriage plate and adjusting at our factory.

Note : By request, mounting and adjustment will be done at our factory before delivery either for ring type or straight type, if a set of journal bearings, carriage plates and rails is ordered.

Joint Ring Guide Way by the following procedures

1)Provisionally fasten the rail fixing screws at both ends of joining rails.
2)Fit the attached key with factory signed marks in a right position properly.
3)Put the attached spring pins and flat-head fixing screws in as illustrated below,and fix the key.
4)Then, firmly fix the provisionally fastened rail fixing screws on both sides.



※When mounting connected Guide Ways/Ring Guide ways, please use precision machined surface of machine frame(Ra3.2 or less recommended).
※Please use shim or such materials to adjust height of rails' connecting area as necessary.
※By request, the joint and adjustment will be done at our factory as long as there is no problem in packaging and transportation.
※At connecting area, rail width does not conform to the specification since levels of V-shaped surfaces are adjusted to meet, but the system runs with no problem by the recommended pre-load values on P.25.

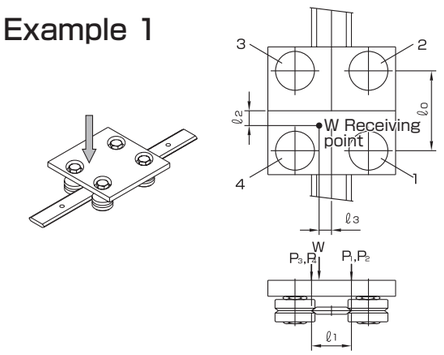
Load Capacity

■Load Capacity of the Motion Guide System varies by such as position of center of works' gravity, position of driving force, speed changes for start and stop, and other effects. For selection please calculate load capacity in consideration of these factors as necessary.

W : Load on the system(N)
P_n : Radial load on journal bearings(N)
P_{nT} : Thrust load on journal bearings(N)

1 kgf = 9.8 N

Example 1



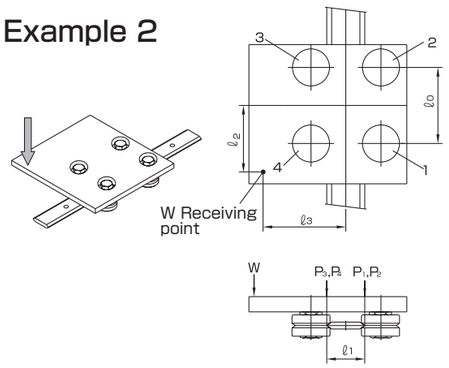
$$P_1 = \frac{W}{4} + \frac{W}{2} \times \frac{\ell_2}{\ell_0} - \frac{W}{2} \times \frac{\ell_3}{\ell_1}$$

$$P_2 = \frac{W}{4} - \frac{W}{2} \times \frac{\ell_2}{\ell_0} - \frac{W}{2} \times \frac{\ell_3}{\ell_1}$$

$$P_3 = \frac{W}{4} - \frac{W}{2} \times \frac{\ell_2}{\ell_0} + \frac{W}{2} \times \frac{\ell_3}{\ell_1}$$

$$P_4 = \frac{W}{4} + \frac{W}{2} \times \frac{\ell_2}{\ell_0} + \frac{W}{2} \times \frac{\ell_3}{\ell_1}$$

Example 2



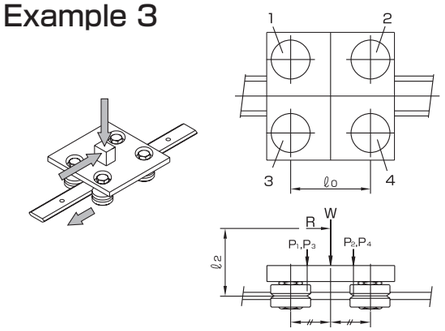
$$P_1 = \frac{W}{4} + \frac{W}{2} \times \frac{\ell_2}{\ell_0} - \frac{W}{2} \times \frac{\ell_3}{\ell_1}$$

$$P_2 = \frac{W}{4} - \frac{W}{2} \times \frac{\ell_2}{\ell_0} - \frac{W}{2} \times \frac{\ell_3}{\ell_1}$$

$$P_3 = \frac{W}{4} - \frac{W}{2} \times \frac{\ell_2}{\ell_0} + \frac{W}{2} \times \frac{\ell_3}{\ell_1}$$

$$P_4 = \frac{W}{4} + \frac{W}{2} \times \frac{\ell_2}{\ell_0} + \frac{W}{2} \times \frac{\ell_3}{\ell_1}$$

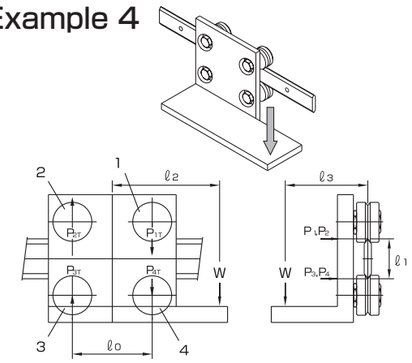
Example 3



$$P_1 = P_3 = \frac{W}{4} - \frac{R}{2} \times \frac{\ell_2}{\ell_0}$$

$$P_2 = P_4 = \frac{W}{4} + \frac{R}{2} \times \frac{\ell_2}{\ell_0}$$

Example 4



$$P_1 = P_2 = -\frac{W}{2} \times \frac{\ell_3}{\ell_1}$$

$$P_3 = P_4 = \frac{W}{2} \times \frac{\ell_3}{\ell_1}$$

$\ell_2 \geqq \frac{\ell_0}{2}$

$$P_{1T} = \frac{W}{2} + W \times \frac{\ell_2}{\ell_0}$$

$$P_{3T} = \frac{W}{2} - W \times \frac{\ell_2}{\ell_0}$$

$P_{2T} = P_{4T} = 0$

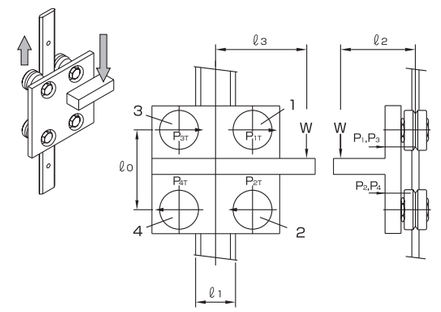
$\ell_2 < \frac{\ell_0}{2}$

$$P_{1T} = \frac{W}{2} + W \times \frac{\ell_2}{\ell_0}$$

$$P_{2T} = \frac{W}{2} - W \times \frac{\ell_2}{\ell_0}$$

$P_{3T} = P_{4T} = 0$

Example 5



$$P_1 = P_2 = P_3 = P_4 = \frac{W}{2} \times \frac{\ell_2}{\ell_0}$$

$\ell_3 \geqq \frac{\ell_1}{2}$

$$P_{2T} = \frac{\ell_3}{\ell_0} \times W + \frac{\ell_1}{\ell_0} \times \frac{W}{2}$$

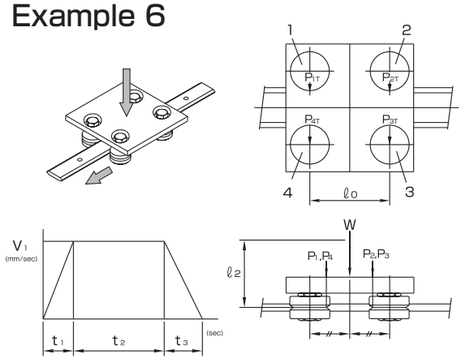
$$P_{3T} = \frac{\ell_3}{\ell_0} \times W - \frac{\ell_1}{\ell_0} \times \frac{W}{2}$$

$P_{1T} = P_{4T} = 0$

$\ell_3 < \frac{\ell_1}{2}$

$P_{1T} = P_{2T} = P_{3T} = P_{4T} = 0$

Example 6



At acceleration

$$P_1 = P_4 = \frac{W}{4} - \frac{W}{2} \times \frac{1}{g} \times \frac{V_1}{t_1} \times \frac{\ell_2}{\ell_0}$$

$$P_2 = P_3 = \frac{W}{4} + \frac{W}{2} \times \frac{1}{g} \times \frac{V_1}{t_1} \times \frac{\ell_2}{\ell_0}$$

At even speed

$$P_{1T} = P_{2T} = P_{3T} = P_{4T} = \frac{W}{4}$$

At slowing down

$$P_1 = P_4 = \frac{W}{4} + \frac{W}{2} \times \frac{1}{g} \times \frac{V_1}{t_3} \times \frac{\ell_2}{\ell_0}$$

$$P_2 = P_3 = \frac{W}{4} - \frac{W}{2} \times \frac{1}{g} \times \frac{V_1}{t_3} \times \frac{\ell_2}{\ell_0}$$

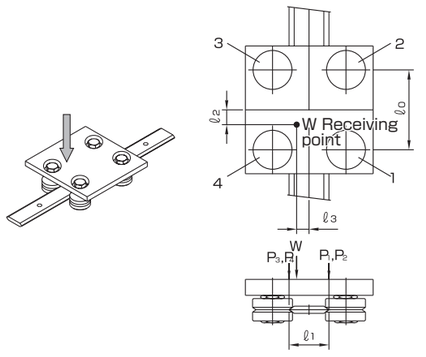
Load Capacity, Calculation Example

■Load Capacity of the Motion Guide System varies by such as position of center of works' gravity, position of driving force, speed changes for start and stop, and other effects. For selection please calculate load capacity in consideration of these factors as necessary.

W : Load on the system(N)
P_n : Radial load on journal bearings(N)
P_{nT} : Thrust load on journal bearings(N)

1 kgf = 9.8 N

Example 1 (See example 1 on P.26)



$$P_1=\frac{W}{4}+\frac{W}{2}\times\frac{\ell_2}{\ell_0}-\frac{W}{2}\times\frac{\ell_3}{\ell_1}$$

$$P_2=\frac{W}{4}-\frac{W}{2}\times\frac{\ell_2}{\ell_0}-\frac{W}{2}\times\frac{\ell_3}{\ell_1}$$

$$P_3=\frac{W}{4}-\frac{W}{2}\times\frac{\ell_2}{\ell_0}+\frac{W}{2}\times\frac{\ell_3}{\ell_1}$$

$$P_4=\frac{W}{4}+\frac{W}{2}\times\frac{\ell_2}{\ell_0}+\frac{W}{2}\times\frac{\ell_3}{\ell_1}$$

Journal Bearings AMJ44 type, Guide Rail AMR44 type
Operating Condition: W =196N, ℓ_0=85 mm, ℓ_1=44 mm

■ Calculation Example

ℓ_2 =20 mm, ℓ_3 =20 mm

$$P_1=\frac{196}{4}+\frac{196}{2}\times\frac{20}{85}-\frac{196}{2}\times\frac{20}{44}=27.51 \qquad P_3=\frac{196}{4}-\frac{196}{2}\times\frac{20}{85}+\frac{196}{2}\times\frac{20}{44}=70.49$$

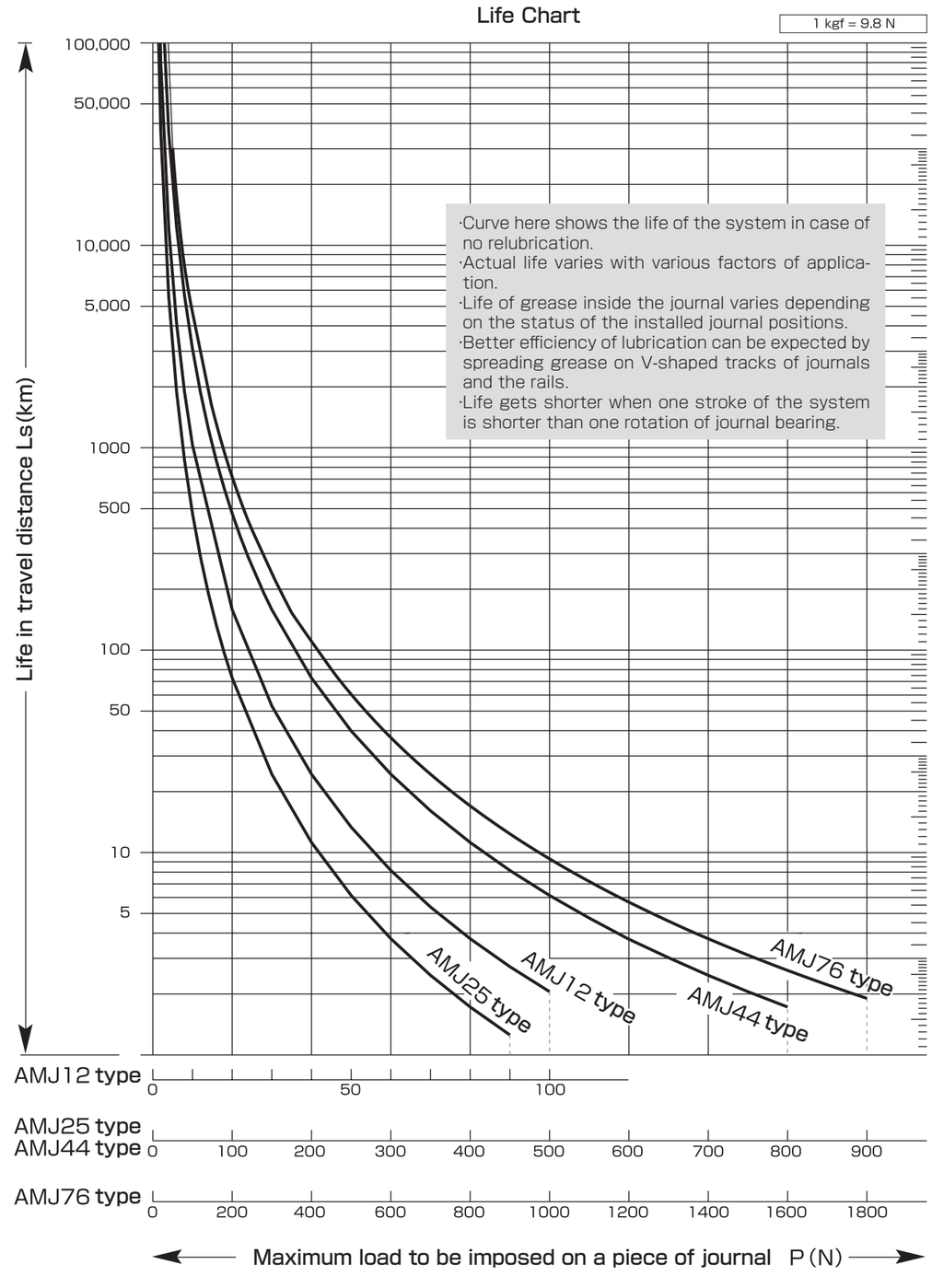
$$P_2=\frac{196}{4}-\frac{196}{2}\times\frac{20}{85}-\frac{196}{2}\times\frac{20}{44}=-18.60 \qquad P_4=\frac{196}{4}+\frac{196}{2}\times\frac{20}{85}+\frac{196}{2}\times\frac{20}{44}=116.60$$

Maximum load capacity in this case is found as 116.60N on P_4, and its life Ls as approximately 300 km as per Life Chart on P.29.Therefore, its life will be approx. 3 years time-wise in case stroke length 2000 mm, 100 strokes per day and 250-days operation per year.

- ●Actual life varies with various factors of application.
- ●Life of grease inside the journal varies depending on the status of the installed journal positions.
- ●Better efficiency of lubrication can be expected by spreading grease on V-shaped tracks of journals and the guide rail.
- ●Life gets shorter when one stroke of the system is shorter than one rotation of journal bearing.

Life

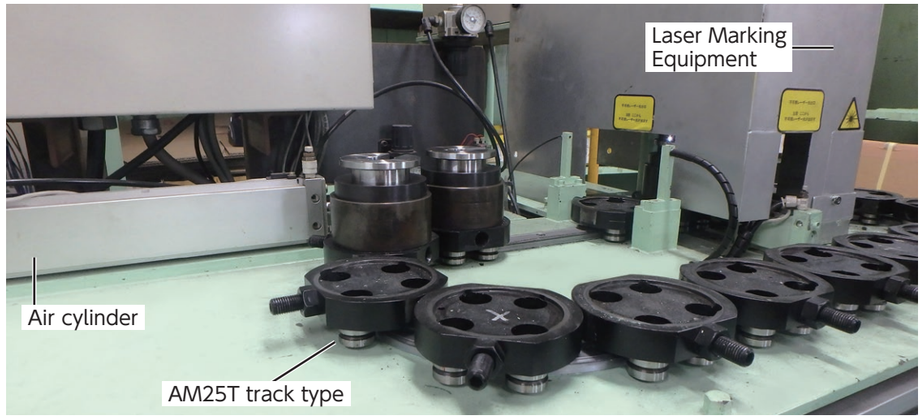
■Approximate Life of Motion Guide System can be obtained from the Life Chart below.



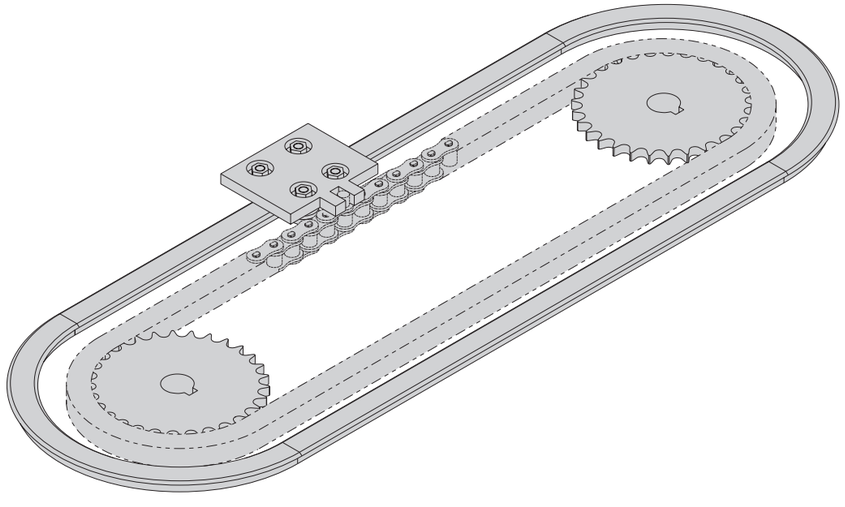
Application Examples

Motion Guide System offers variety of design by combination of Rails and standard/special Carriage Plates.

Laser Marking equipment by track system



Track System by chain drive

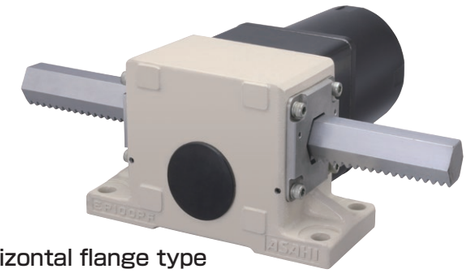


※Moving speed at round area may exceed the maximum speed at straight area.
※Specification is subject to change without prior notice.

ELECTRIC PUSHER

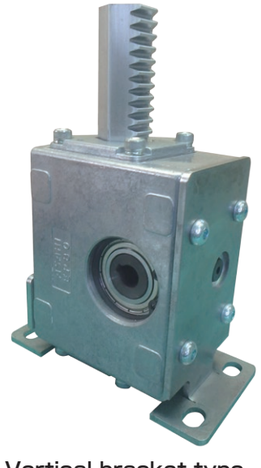
EP SERIES

Converting rotary movement into linear motion by rack and pinion structure.
Smooth and stable linear motion by roller bearings inside.
Maximum carrying load is 1500N possible by choice of motor to match with application.



Horizontal flange type
EP100PF
EP150PF

Vertical flange type
EP100VF
EP150VF



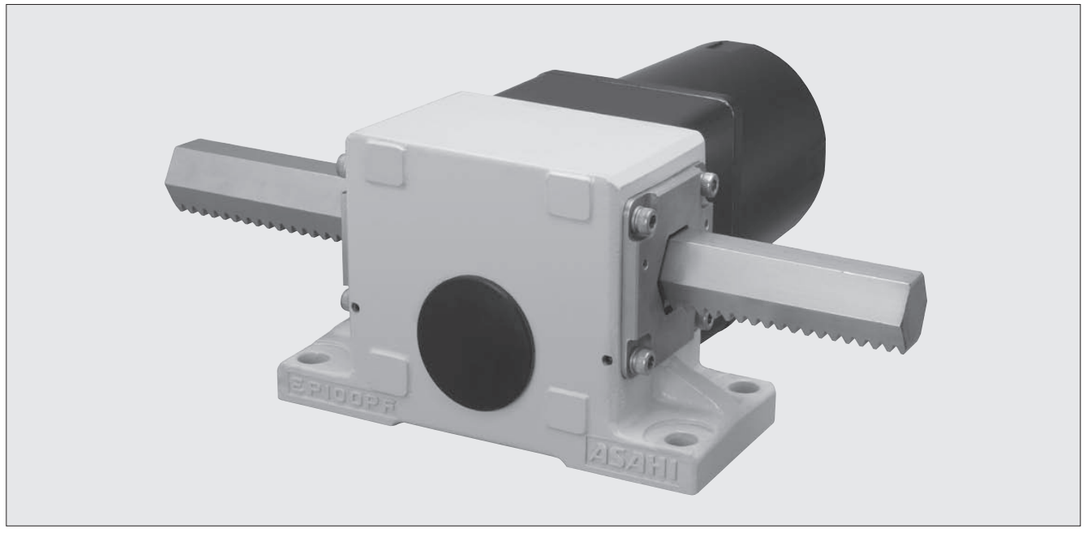
Vertical bracket type
EP80V

ASAHI Electric Pusher EPseries

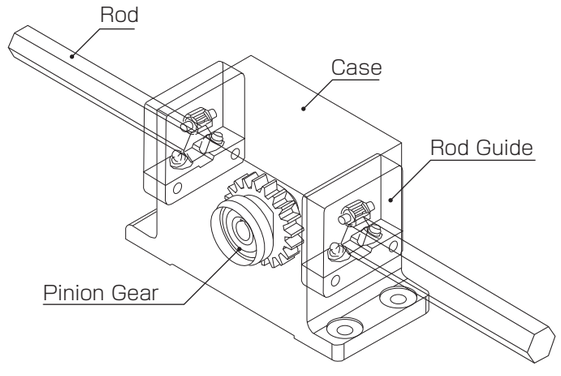
Easy mounting, Linear motion unit by either motor or manual operation, Motor is selectable to match application

Electric Pusher is standardized unit component which converts rotary movement into linear motion on hexagonal rod by rack and pinion structure, and works automatically to push and pull. The hexagonal rod is supported by roller bearings; one on the top side, and the other two on the lower sides.

Maximum carrying load is 1500N possible by choice of motor to match with application.



(Motor and Gearhead are not included.)



Features

● **Simple structure and stable linear motion**
Drive and guide functions are integrated in one unit, realizing stable movement. Rod tooth profile is on circular pitch (CP), so that stroke setting can be done by mm.

● **Smooth and low noise**
Needle roller bearings are incorporated as rod guide, which help much for smooth movement at low torque. Inner clearance of rod guide module is adjustable by using pre-pressure control device, which also realizes smooth movement without any other guide outside.
Grease coating is not necessary on rod.

● **Strong moment loads acceptable**
Smooth movement is available whichever direction of loads the unit receives except axial direction, since the hexagonal rod is supported by 3 planes on hexagonal faces as well as 2 points at both sides.

● **Various motor types applicable**
Wide motor selection is available at your needs to match movement direction and necessary thrust force; push, pull, hang up or down.

● **Rod length at your need**
Rod length is flexible as designated at your need. Also screw holes at ends of rod are prepared at our factory if required.

Structure

● **Main unit**
Converting rotary movement into rod's linear motion by rack and pinion structure. Pinion module receives a drive shaft.

● **Rod Guide module**
Rod inlet ports are open at both sides of the unit, and needle roller bearings are set in triangle position each other for support and guide of the rod at each inlet port. The bearings work effective to get rod movement smooth.

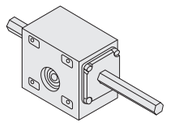
● **Hexagonal Rod**
The rod has rack underneath.
For the rod, 2 different materials are prepared; Carbon Steel S45C for machine construction and Stainless Steel SUS304BF, and surface treatment is Hard-chromium plating, for either material to improve surface wear resistance.

● **Mounting Parts**
Bracket type is standard specification for EP80.

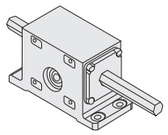
Assemblies and Components

Interchangeable with various types of motors, Flexible selection of components available to required application and moving direction.

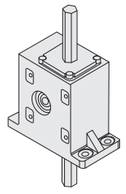
Assembled Units



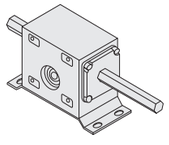
Main unit



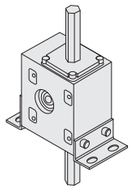
Horizontal flange type



Vertical flange type

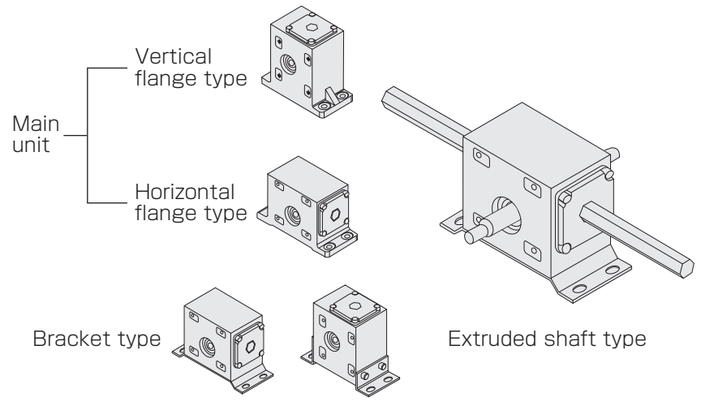


Horizontal bracket type

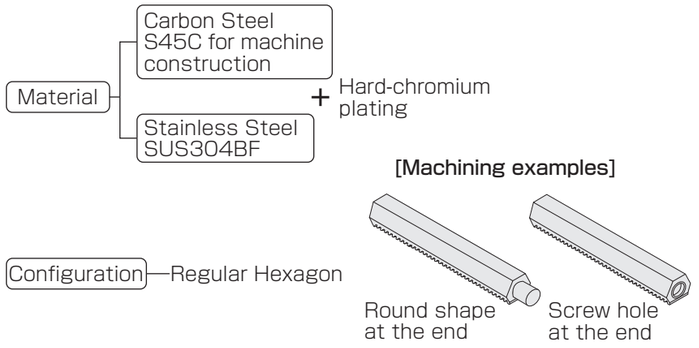


Vertical bracket type

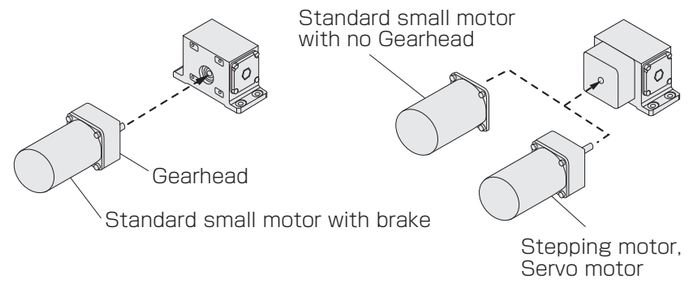
Main unit



Rod



Motor, Gear Head, Brake



Note: Motors and Gearheads must be prepared by customers.

Performance and Specifications

Performance

Moment Load

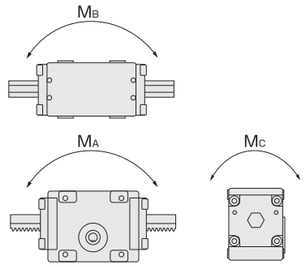


Table 1. Performance

Item		Type EP80	EP100	EP150
Maximum Thrust Force (see note below) (N)		800	1000	1500
Rod travelling distance per rotation of input-shaft (mm)		80	90	120
Maximum Speed (mm/sec)		1000	1000	1000
Allowable Moment Load (N・m)	MA	56.8	65.7	88.4
	MB	49.0	56.8	76.6
	MC	13.7	28.4	32.8
Backlash (mm)		0.3～0.5		

Note:Above thrust force is the maximum thrust force the electric pusher allows

Specifications

Main unit Material : Case/Aluminum
Needle Roller bearings of the guide /SUJ
Pinion/S45C

Rod

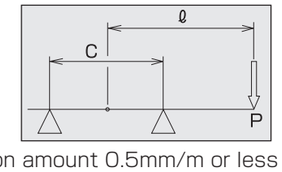
Material : S45C/SUS304BF
Stainless SUS304BF type rod is shown by prefix "S-" to its part number.
Surface Treatment : Hard-chromium plating (No treatment is done on faces at both ends and further machined area if any)
Pitch Allowance : ± 0.01mm
Accumulated Allowance : 0.02mm/300mm
Pressure Angle : 20°
Torsion, Bend : EP80～EP150 0.3mm/1000mm

Deflection : $\delta = \dfrac{P \cdot \ell^3}{16E \cdot I}$

δ : Deflection Amount mm
P : Load N
ℓ : Distance from main unit to load point mm
E : Vertical Elastic Coefficient kgf/mm^2
I : Secondary Moment of cross section mm^4
C : Distance between Bearings (see P.43)

	EP80	EP100	EP150
I	14081	19917	48711

S45C : E=2.10×10^4 k g f／mm^2
SUS304 : E=1.97×10^4 k g f／mm^2



※ It is advisable to keep rod deflection amount 0.5mm/m or less for smooth and stable movement of the pusher.

Bracket

Material : SPCC
Surface Treatment : Uni-chrome plated

Note: Bracket type is standard specification for EP80 only.
Specification is subject to change without prior notice.

Note before starting operation

Operating Temperature range

-10℃～90℃

Causes of Malfunction

- When exceeding the abovementioned Operating Temperature range
- Seizure of inside bearing of main unit due to operating environment or high speed and consequent grease run-out
- Outer ring crack of needle roller bearing inside due to such as vibration or shock load
- Grease deterioration of needle roller bearing
- Fracture of pinion gear or rod due to excess shock load

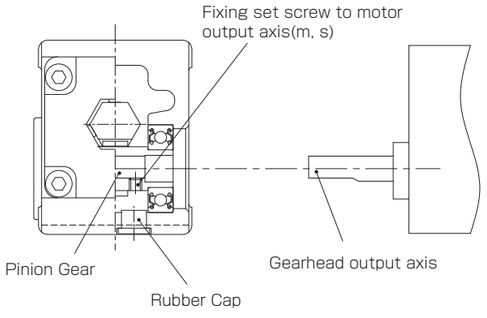
The aboves are thinkable causes of malfunctions of the unit. Sometimes, they are originated from inappropriate mounting, application error, incomplete peripheral design, and so forth, so please pay careful attention.

Connection of Motor and Gearhead

Please follow the procedures below when connecting.

1. First insert a rod to the main body of the unit, in case of a motor with brake or a gear head with big reduction ratio.
2. Install gear head by setting output axis to hole with keyway.
3. Tighten fixing set screw "m" to motor's output axis by a hexagonal spanner of width across flat "s". "m"=M5x5 and "s"=2.5mm for all EP80, EP100 and EP150.
4. Fix the electric pusher, motor, and gearhead.
5. Put a rubber cap in.

Note: Not compatible with new standard motors and gearheads.
If the shaft diameter (with eccentricity) of the motor does not match, use a flexible coupling or similar. Motors and gearheads are not available from us, and must be prepared by customers.



Others

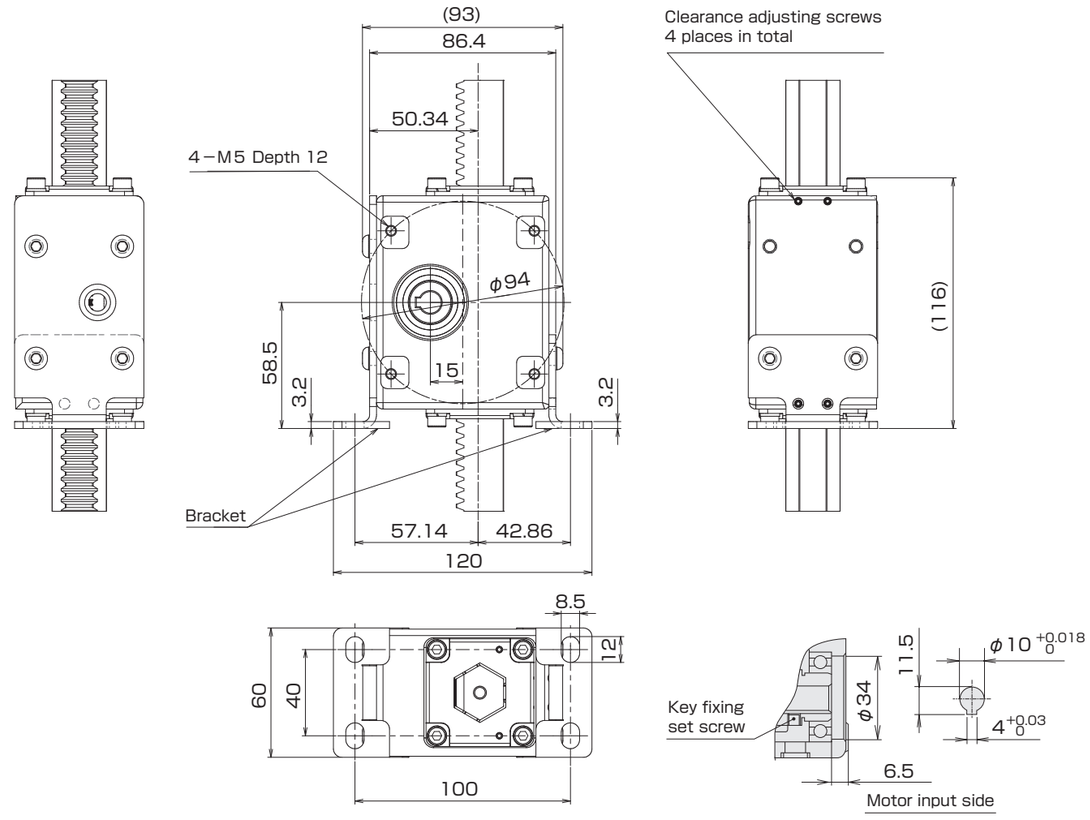
- When two or more Electric Pushers are used in parallel with one drive, please use a spacer or like to adjust the mounting position since the rod tip phase is shifted.
- Please pay careful attention to a rod not to drop down when using a unit vertically, and take some measures to prevent the drop such as by selecting a motor with brake.
- There sometimes will be scratches, scrapes, gap, stains, bald spots of surface treatment and so on, to the extent there is no problem for performance of the unit.

Dimensions EP80 series

All dimensions herein are in mm, unless otherwise specified

Vertical bracket type

Part Number : EP80V
Weight : 1.3kg

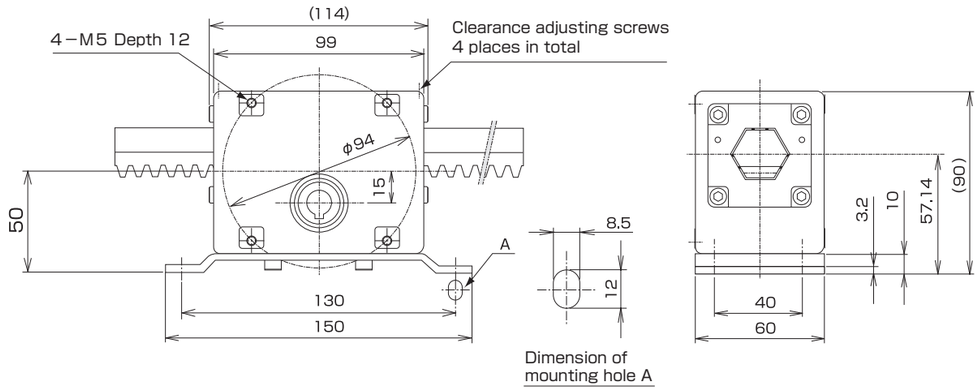


Dimensions EP80 series

All dimensions herein are in mm, unless otherwise specified

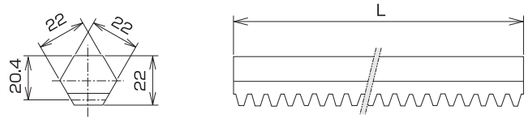
Horizontal bracket type

Part Number : EP80P
Weight : 1.3kg



Rod

Part Number : (S-) EP80×L
Weight : L×3.4×10^{-3} (kg/mm)



Part Number
EP80×L/S-S Screw holes premachined at both ends
EP80×L/S Screw hole premachined at one end

■ Standard Stroke and Rod Length

Unit : mm

Numbers of Strokes	100	200	300	400	500	600	700	800
Rod Length (L)	250	350	450	550	650	750	850	950

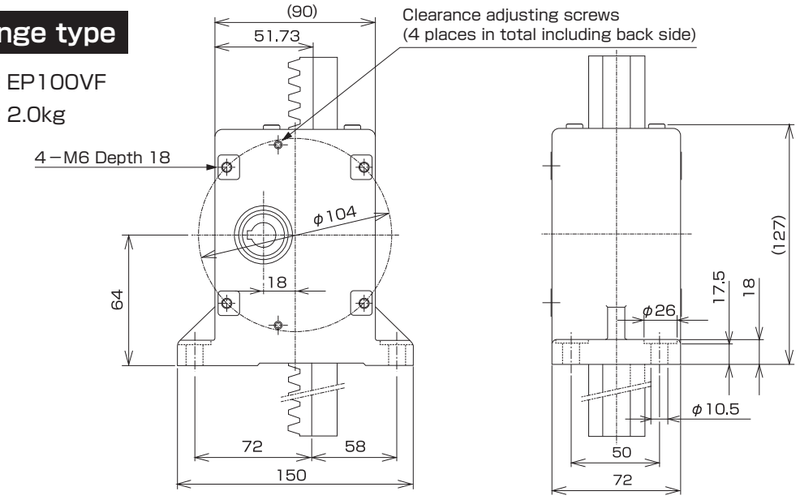
Note 1. Non standard rod length than above is available by 1mm.
2. If you cut and machine by yourself after purchase, please purchase longer rods of 1000mm or more.

Dimensions EP100 series

All dimensions herein are in mm, unless otherwise specified

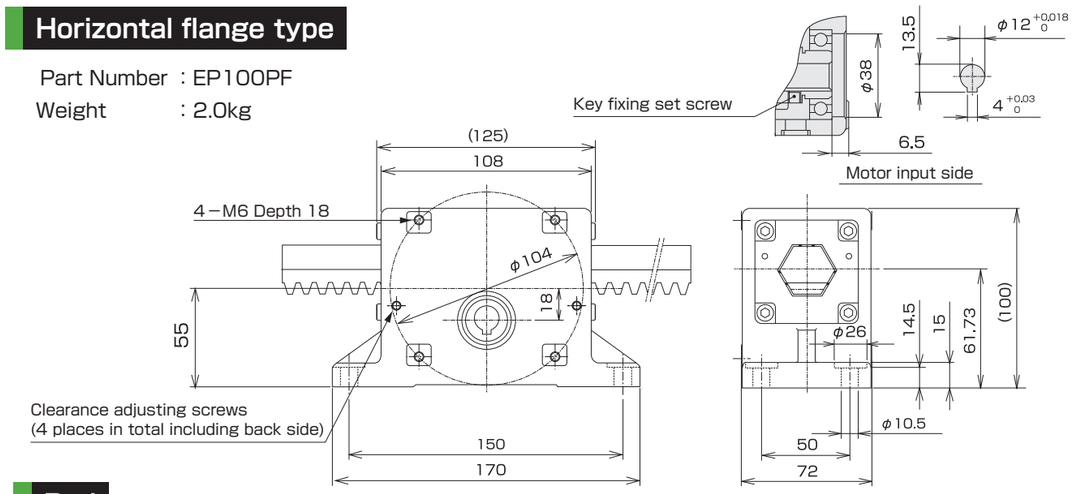
Vertical flange type

Part Number : EP100VF
Weight : 2.0kg



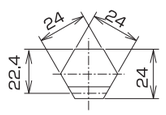
Horizontal flange type

Part Number : EP100PF
Weight : 2.0kg

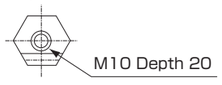


Rod

Part Number : (S-) EP100×L
Weight : L×4.0×10^{-3} (kg/mm)



Part Number
EP100×L/T-T Screw holes premachined at both ends
EP100×L/T Screw hole premachined at one end



■ Standard Stroke and Rod Length

Unit : mm

Numbers of Strokes	100	200	300	400	500	600	700	800
Rod Length (L)	300	400	500	600	700	800	900	1000

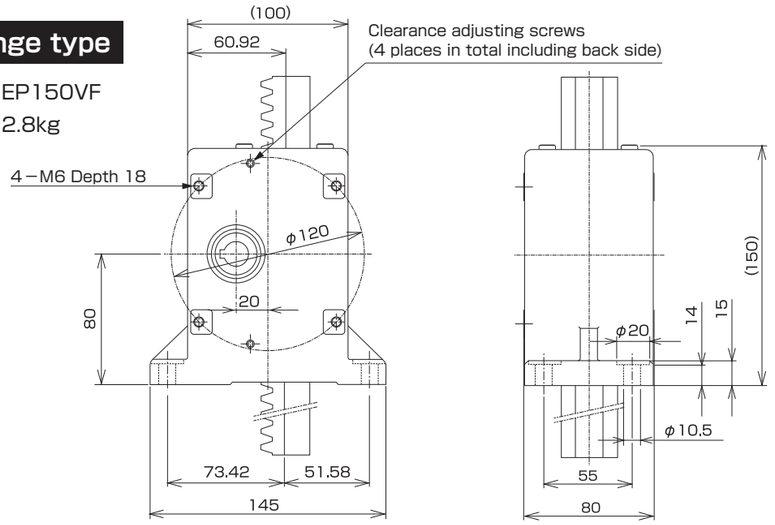
Note 1. Non standard rod length than above is available by 1mm.
2. If you cut and machine by yourself after purchase, please purchase longer rods of 1000mm or more.

Dimensions EP150 series

All dimensions herein are in mm, unless otherwise specified

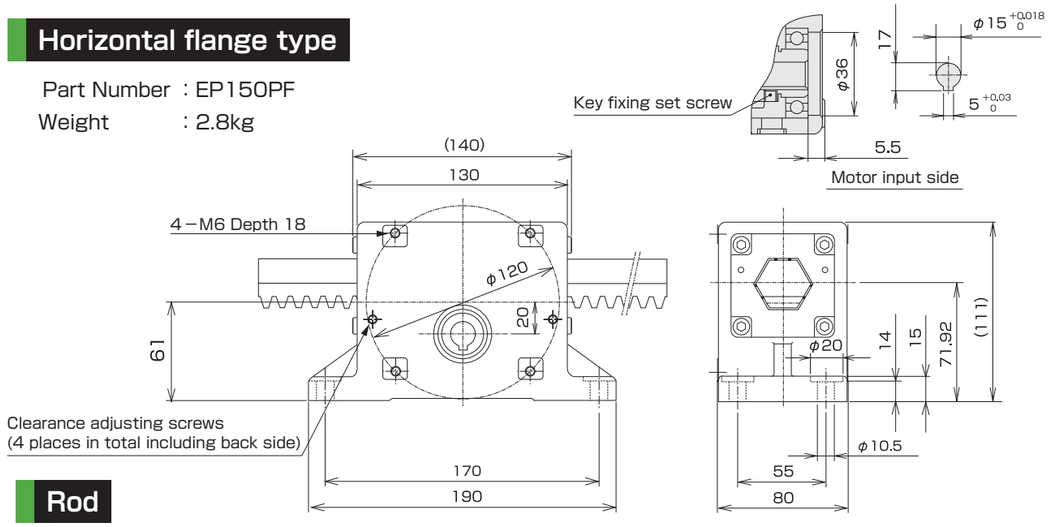
Vertical flange type

Part Number : EP150VF
Weight : 2.8kg



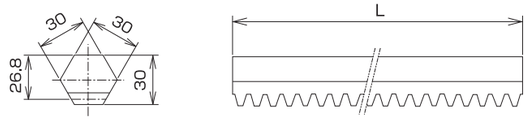
Horizontal flange type

Part Number : EP150PF
Weight : 2.8kg



Rod

Part Number : (S-) EP150×L
Weight : L×6.3×10^{-3} (kg/mm)



Part Number
EP150×L/T-T Screw holes premachined at both ends
EP150×L/T Screw hole premachined at one end

■ Standard Stroke and Rod Length

Unit : mm

Numbers of Strokes	100	200	300	400	500	600	700	800
Rod Length (L)	300	400	500	600	700	800	900	1000

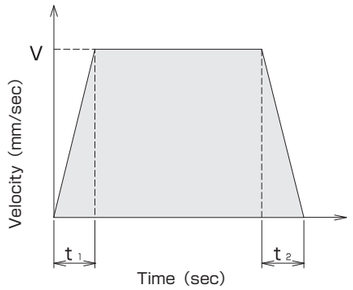
Note 1. Non standard rod length than above is available by 1mm.
2. If you cut and machine by yourself after purchase, please purchase longer rods of 1000mm or more.

Load Calculation

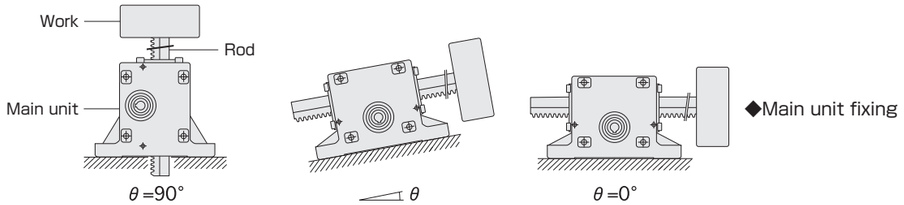
● Load to Electric Pusher varies by such as gravity center position of the work, speed changes by acceleration/deceleration at starting/stopping, and other actions involved. Please make load calculation for selection of Electric Pusher in consideration of the following conditions;

To confirm operating conditions

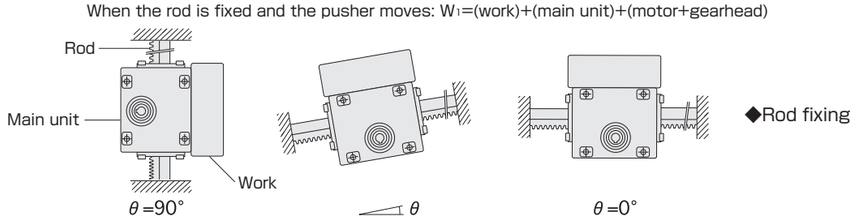
Total Weight of the work : W (W$_1$ or W$_2$)[kg]
Velocity : V [mm/sec]
Time length of acceleration/deceleration : t [sec]
Use shorter one of t$_1$ and t$_2$



When the pusher is fixed and the rod moves: W$_2$=(work)+(rod)



When the rod is fixed and the pusher moves: W$_1$=(work)+(main unit)+(motor+gearhead)



Load Calculation

Please get value of W by referring the above mounting examples, and calculate necessary Thrust Force by formulas below.

Starting Thrust Force $F=\{F_A+9.8\times W\times(\sin\theta+\mu\times\cos\theta)\}\times S[N]$

Inertia Force $F_A=\dfrac{V\times W}{1000\times t}$ [N]

Friction Factor μ=0.1 at rod guide portions of the pusher
Safety Factor S=1.5～2.0

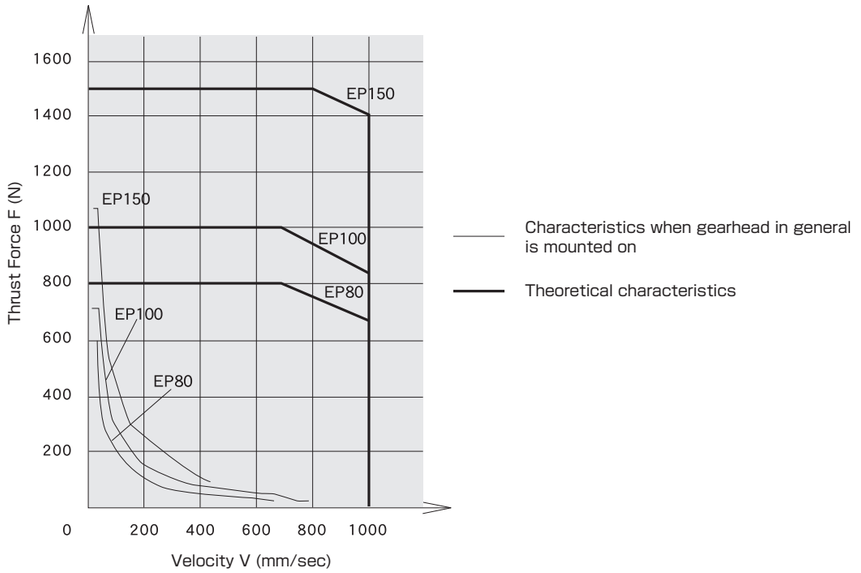
Selection

Please select the unit which has bigger Maximum Thrust Force on P.35, Table 1 than the calculated value F.

Load Calculation

To confirm Thrust Force and Speed Characteristics

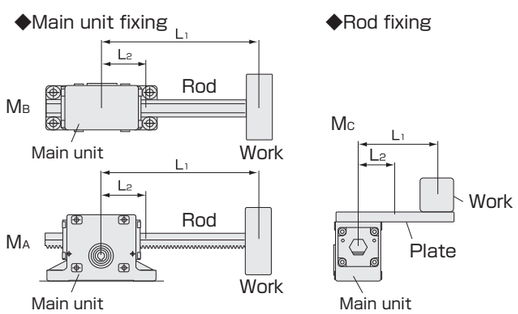
Maximum Thrust Force is set based on the strength of dedendum of pinion gear. Also Inertia Force at acceleration/deceleration has to be taken into account for necessary Thrust Force. So, please confirm whether or not operating condition is within characteristic diagram below.



Above characteristics are proportional to acceleration/deceleration time "t". (Curve line shows calculated value when "t" is 0.1 second)
In addition, allowable torque of driving force, such as motor, gearhead, has to be taken into account.

Moment Load

Please calculate Moment Load by formulas below, and confirm whether they are within allowable range by referring to Page 35, Table 1.



$M_A = 9.8 \times (M_1 \times L_1 + M_2 \times L_2)$ [N・m]
$M_B = 9.8 \times (M_1 \times L_1 + M_2 \times L_2)$ [N・m]
$M_C = 9.8 \times (M_1 \times L_1 + M_2 \times L_2)$ [N・m]

M_1: Weight of work(kg)
M_2: Weight of rod or plate(kg)
L_1 : Horizontal distance from the center of Electric Pusher to the center of gravity of the work(m)
L_2 : Horizontal distance from the center of Electric Pusher to the center of gravity of the rod or plate(m)

Life Calculation

Life of the electric pusher is defined as the life of needle roller bearings at rod guide areas of the pusher.
Rating life is the total travel distance reached without causing material flaking due to rolling fatigue by 90% of a group of identical pushers which are operated independently under the same conditions. Life calculation is done by the following formulas.

Fig 6.1 $P = \frac{W_1}{2}$

P : Load on bearings [N]

Lo : Horizontal distance from the center of Electric Pusher to the center of gravity of the work(m)in Fig6.2 and Fig6.3

Fig 6.2 $P = \frac{1}{3} \times P_{min} + \frac{2}{3} \times P_{max}$

$= \frac{1}{3C} \times \left(W_2 \times Lo - \frac{3}{2} \times C \times W_2 + 2 \times M_1 \times L_1 + 2 \times M_2 \times L_2 \right)$

Fig 6.3 $P = \frac{1}{3} \times P_{min} + \frac{2}{3} \times P_{max}$

$= \frac{1}{3C} \times \frac{\sqrt{3}}{2} \times \left(W_2 \times Lo + \frac{1}{2} \times C \times W_2 + 2 \times M_1 \times L_1 + 2 \times M_2 \times L_2 \right)$

Service Life in distance $L_m = A \times \left(\frac{f_H}{P \times f_S} \right)^{\frac{10}{3}}$

Fig 6.1

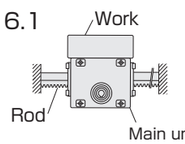


Fig 6.2

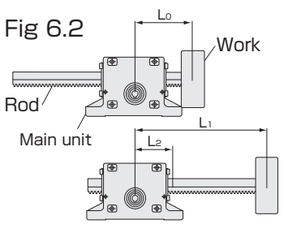
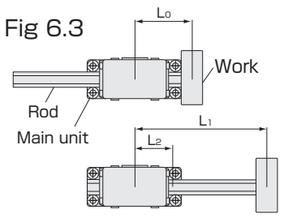


Fig 6.3



Invariable

	EP80	EP100	EP150
C	94	102	114
A	0.691×10^{15}	0.691×10^{15}	0.691×10^{15}

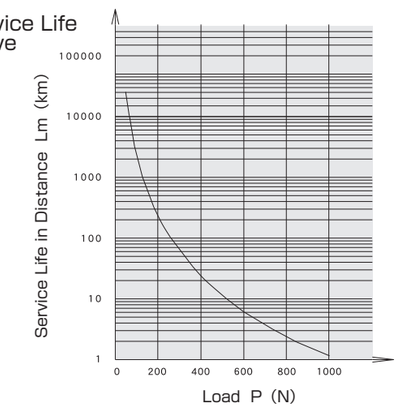
Track Capacity Factor

Rod Material	SUS304BF	S45C
f_H	0.65	1

Load Factor

Load Type	Smooth operation	Normal operation	Operation including shock load and/or vibration
f_S	1~1.5	1.5~2	2~3.5

Service Life Curve



Please take life of motor and gearhead into account, and refer to catalogs of motor manufacturers for details.

Load Calculation

Selection of Motor type

	Induction	Reversible		Speed Controller		Servo		Stepping	
			With electric brake		With electric brake		With electric brake		With electric brake
Forward/Reverse operation	×	◎	◎	△	△	◎	◎	◎	◎
Continuous operation	◎	×	×	△	△	◎	◎	◎	◎
Instantaneous stop	×	○	○	△	△	◎	◎	◎	◎
Holding	×	×	◎	△	◎	×	◎	×	◎
Velocity control	×	×	×	○	○	◎	◎	◎	◎
Frequent start/stop	×	×	×	×	×	×	×	×	×
Positioning	×	×	×	×	×	◎	◎	◎	◎

◎: most suitable
○: suitable
△: depends on conditions or types
×: not suitable

Note: Please refer to catalogs of motor manufacturers for details

Calculation of Reduction Gear Ratio

Reduction gear ratio $i=\frac{N}{N_G}$

Rating RPM of motor N [r/min]

Required RPM of gearhead $N_G=\frac{60\times V}{\text{(Rod moving amount per shaft single revolution)}}$ [r/min]

Please select a gearhead which has close reduction gear ratio to the value "i". However, in case of standard AC motor, it starts moving slower than calculated timing since rpm goes down by 10% plus some when load is imposed. Conversely, it starts moving quicker in case of downward operation by vertical use.

Calculation of Torque

	EP80	EP100	EP150
D_P (mm)	25.46	28.64	38.19
GD_P^2 (kg·mm^2)	0.1564	0.313	1.3198

Torque required $T_L=\frac{F\times D_P}{2\times\eta}$ [N·mm]

Pitch circle diameter of pinion gear D_P [mm]
Efficiency of rack pinion $\eta=0.9$

Torque load converted to motor shaft $T_M=\frac{T_L}{i\times\eta_G}$ [N·mm]

Efficiency of gearhead η_G
Moment of inertia $GD^2=GD_W^2+GD_P^2$ [kg·mm^2]

Moment of work's inertia $GD_W^2=W\times\left(\frac{X}{2\times\pi}\right)^2$ [kg·mm^2]

Rod moving amount per shaft single revolution X [mm/rev]
Moment of pinion's inertia GD_P^2 [kg·mm^2]

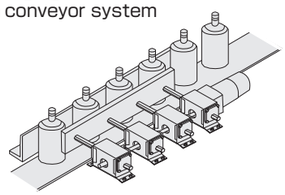
Approach and calculation method for moment of inertia vary by motor type, so please refer to technical information of motor manufacturers and so forth, for details.

Selection of Motor

Please select a motor which has allowable torque more than the value of T_M or more. Also, please confirm whether allowable torque of gearhead is more than the value of T_L and whether allowable inertia load is more than the value of GD^2.

Selection Example 1

Equipment : Changing work flow width on conveyor system



4 electric pushers are connected, and it changes the width of work flow by products on conveyor system by using reversible motor with electric brake. Power supply is shut off once the position is set, and it is maintained until next set-up change.

(1)To confirm operating conditions

Total Weight of the work including plate and rod	W=150[kg]
Velocity	V=20[mm/sec]
Stroke	s=80[mm]
Time length of acceleration/deceleration	t=0.1[sec]
Power source	single phase100V[60Hz]

(2)Calculation

Required Starting Thrust Force (See Page 41)

$F=\{F_A+9.8\times W\times(\sin\theta+\mu\times\cos\theta)\}\times S$

$=\left\{\frac{20\times150}{1000\times0.1}+9.8\times150\times(\sin0^\circ+0.1\times\cos0^\circ)\right\}\times2=354$[N]

(3)Selection of Electric Pusher

According to the above calculation result, EP80 is selected as its maximum thrust force is 800(N), and make sure that its operating condition is within characteristic diagram of Thrust Force and Velocity on P.42.

(4)Calculation of Reduction Gear Ratio and Selection of Gearhead

As Rated RPM of a motor by 60Hz is 1400 thru 1500[r/min] putting N=1450[r/min].

$i=\frac{N}{N_G}=\frac{1450}{\frac{60\times20}{80}}=96.67$ Select a gearhead of reduction ratio 1/100, as the closer to the calculation result, as explained on P.44

(5)Selection of Motor

①Load Calculation

Load Torque $T_L=\frac{F\times D_P}{2\times\eta}=\frac{354\times25.46}{2\times0.9}=5007.13$[N · mm]

Load torque converted to motor shaft $T_M=\frac{T_L}{i\times\eta_G}=\frac{5007.13}{100\times0.66}=75.87$[N · mm]

②Selection of Motor

Motor has to cover starting torque bigger than "T_M" value , so a motor with the following specification is selected, for example.

Rating RPM : 1450[r/min]
Starting Torque : 140[N · mm]
Rating Torque : 170[N · mm]

Also, as allowable torque of the selected gearhead is bigger than "T_L" value, so the motor selected is appropriate to the operating conditions. (Plesse refer to the motor manufacturer's catalog.)

(6)To confirm inertia moment

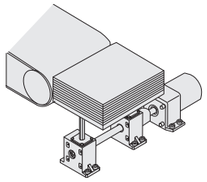
Inertia Moment $GD^2=GD_W^2+GD_P^2=150\times\left(\frac{80/1000}{2\times\pi}\right)^2+0.1564\times10^{-4}=2.43\times10^{-2}$[kg · m^2]

Allowable load of inertia moment $J_G=7.75\times10^{-2}$[kg · m^2]

Allowable load of inertia moment at driving axis of gearhead J_G appears as $J_G>GD^2$, so it can be judged that the selection is applicable to the operating condition.

Selection Example 2

Equipment : Work Stocker



2 electric pushers are connected, and it lowers stock table by 5mm by servo motor. The motor is electromagnetic type in preparation for power supply failure.

(1)To confirm operating conditions

Total Weight of the work including table and rods	W=60[kg]
Velocity	V=10[mm/sec]
Stroke	s=100[mm]
Time length of acceleration/deceleration	t=0.125[sec]
Power source	single phase100V[60Hz]

(2)Calculation

Required Starting Thrust Force (See Page 41)

$$F=\{F_A+9.8\times W\times(\sin\theta+\mu\times\cos\theta)\}\times S$$

$$=\left\{\frac{10\times60}{1000\times0.125}+9.8\times60\times\ (\sin90^\circ+0.1\times\cos90^\circ)\right\}\times2=1185.6[N]$$

On the premise that each pusher supports the stock table by even power, thrust force required for each pusher will be ; 1185.6/2=592.8[N]

(3)Selection of Electric Pusher

According to the above calculation result, EP80 is selected as its maximum thrust force is 800(N), and make sure that its operating condition is within characteristic diagram of Thrust Force and Speed on P.42.

(4)Torque Calculation

①Load Torque $T_L=\frac{F\times D_P}{2\times\eta}=\frac{1185.6\times\frac{25.46}{1000}}{2\times0.9}=16.77[N\cdot m]$

②Calculation of Speed

Required RPM of input axis to electric pusher $N_G=\frac{60\times10}{80}=7.5[r/min]$

Intermittent moving amount of the table	l=5[mm]
Moving amount per single revolution of motor	l_0=80[mm]
Step angle	θ_S=0.036[°]
Starting pulse speed	f_1=0
Time length until intermittent stop	t_0=0.5[sec]

Numbers of pulse for an intermittent movement $A=\frac{l}{l_0}\times\frac{360^\circ}{\theta_S}=\frac{5}{80}\times\frac{360}{0.036}=625$

Pulse speed for single intermittent movement $f_2=\frac{A-f_1\times t}{t_0-t}=\frac{625-0\times0.125}{0.5-0.125}=1666.7$

③Load Calculation

Inertia moment of Rotor $J_O=0.196\times10^{-1}[kg\cdot m^2]$

Total inertia moment $J_L=GD_W^2+GD_P^2=60\left(\frac{80}{2\pi}\right)^2+0.1564\times2=9727.15[kg\cdot mm^2]=9.73\times10^{-3}[kg\cdot m^2]$

Acceleration/deceleration torque $T_A=(J_O+J_L)\times\frac{\pi\times\theta_S}{180}\times\frac{f_2-f_1}{t}=(0.196\times10^{-1}+9.73\times10^{-3})\times\frac{\pi\times0.036}{180}\times\frac{1666.7-0}{0.125}$ $=0.25[N\cdot m]$

Torque required $T=T_L+T_A=16.77+0.25=17.02[N\cdot m]$

(5)Selection of Motor

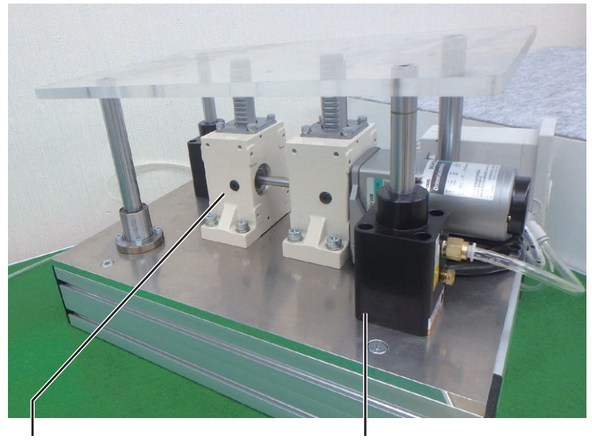
Motor has to have Rated torque bigger than the calculated torque required T, and required RPM N_G of gear head has to be within motor's allowable RPM. So, please select such a motor with the following specification.

Rated torque	25.7[N · m]
Velocity range	0～120[r/min]

※(Plesse refer to the motor manufacturer's catalog.)

Application Examples

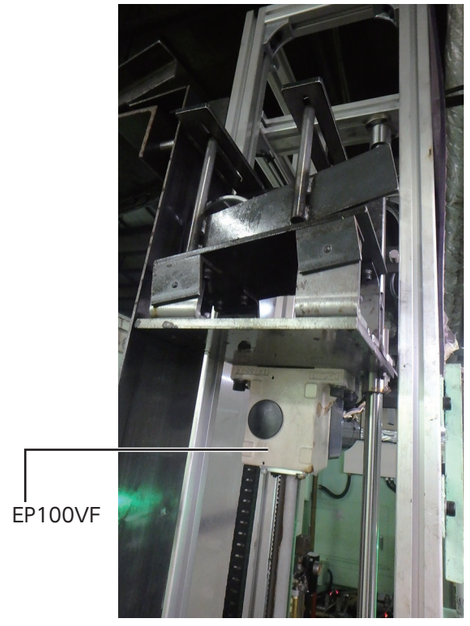
Elevating Table and Support Brake



Elevating table by electric pushers, plus air support brake for table support.

Note: EP80VF is no longer available as its production is discontinued.

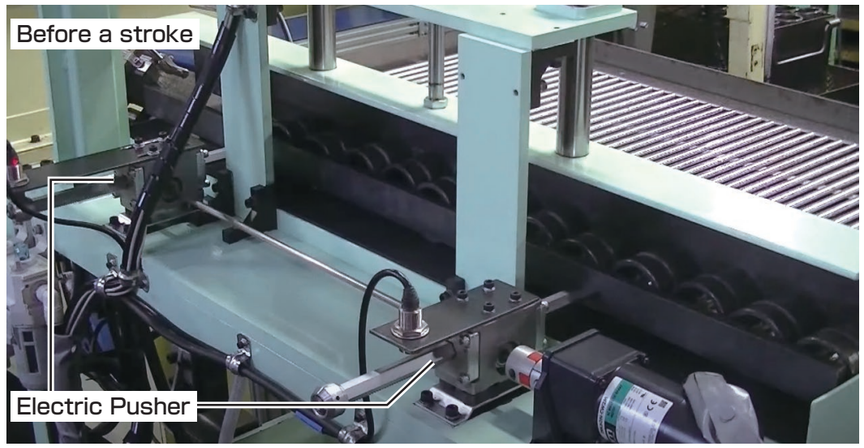
Transportation Equipment of Bearing Works

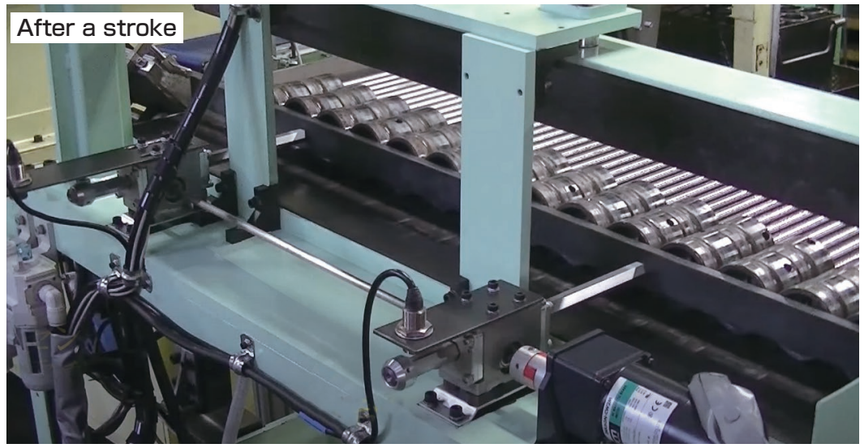


Elevating bearing works by electric pusher to grinding machine.

Application Examples

Simultaneous Actuation by single motor





When detecting by a sensor, 2 electric pushers are actuated simultaneously by a single motor

HAND SHAFT BRAKE

HSB type

Clamp and release by simple and quick handling.
To hold shaft in both directions of axis and rotation.
Less damage to shaft due to resin contact parts.

Hand Shaft Brake HSB type

Features

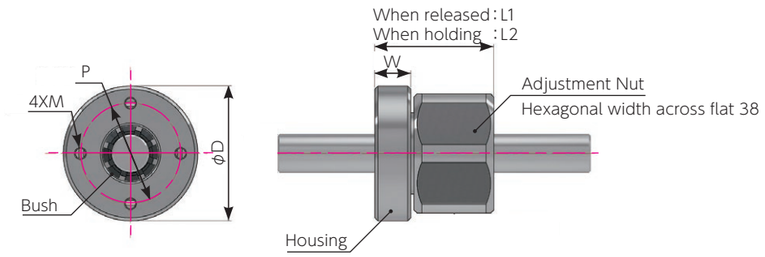
- **Efficient Holding Power**
  To hold shaft in both directions of axis and rotation
- **Easy and Quick Handling**
  Clamp and release by simple and quick handling
- **Safe and secured mechanism**
  Preventive design of nut falling when clamping is released
- **Compact Design**
  To contribute downsizing of equipment

Part Number

H S B □□

- Shaft diameter
  - 12
  - 16
  - 20※
  - ※Please consult us.
- Symbol of Hand Shaft Brake

Dimensions



(Unit:mm)

Part Number	Shaft size	D	L1	L2	W	P	M
HSB12	ϕ12	43	37	39	11.5	P.C.D32	M4×0.7
HSB16	ϕ16	49	42	44	16.5	P.C.D38	M4×0.7

Note. Please use a shaft with negative tolerance. In the case of positive tolerance, the shaft may not be fit into the bush.

Specifications

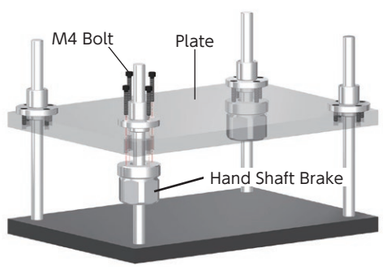
Part Number	Holding Power※		Weight (kg)
	Axial direction (N)	Rotation direction (N・m)	
HSB12	400	2.4	0.3
HSB16	400	3.2	0.4

※Specifications with g6 hardened shaft

Materials

Part Number	Housing	Adjustment Nut	Bush
HSB12	Carbon Steel S45C with Trivalent Chromate		Nylon
HSB16			

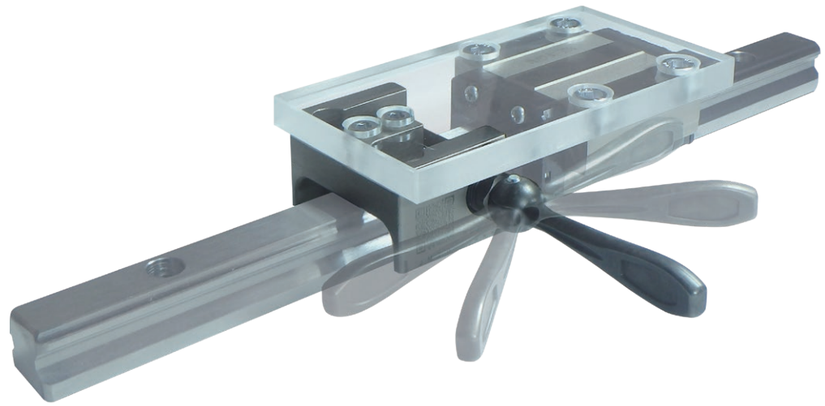
Application Example



LINEAR BRAKE

RBH type
Manual Clamper

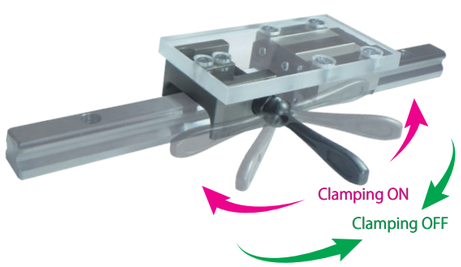
Both clamping device and return spring function are incorporated in one body.
Clamping ON and OFF by the one-touch lever actions.



Features

- **Non-backlash mechanism**
  Both clamping device and return spring function are incorporated in one body.
- **Visualizing clamping condition**
  Horizontally toward rail direction, clamping ON by flipping lever toward rail, and clamping OFF by raising lever square to rail.
- **Easy operation**
  Clamping ON and OFF by the one-touch lever actions.
- **Space saving**
  Compact design much more than air-actuating type linear brakes.

Operation Design



Part number

R B H □□ □□□

Product type
Symbol of RBH type Manual Clamper

Size type
15
20
25
30
35
45※1

Applicable Rail type※2	
Rail Manufacturer	Rail type
THK	HSR, SHS, SR
IKO	LWE(ME), LWH(MH)
NSK	NH(LH), NS(LS)

Example of part number

RBH 25 SHS

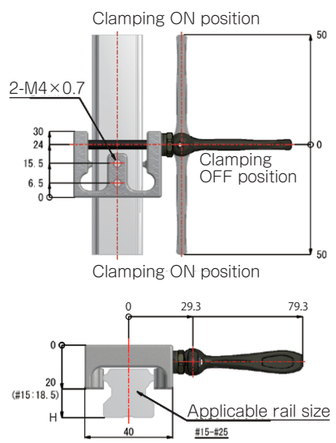
Product type : Linear Brake Manual Clamper
Size : 25
Rail manufacturer : THK
Rail type : SHS

Note ※1. Size #45 is not applicable to NSK NS type rail.
※2. Please consult us for rail types not listed on the above table.

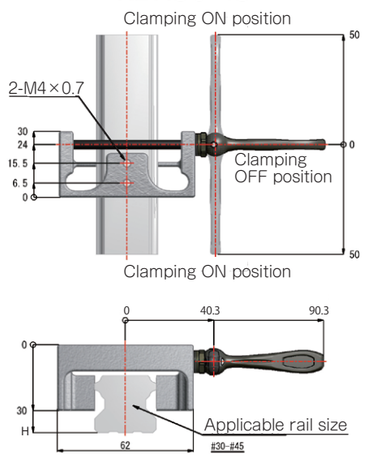
Dimensions

(Unit : mm)

RBH15-25



RBH30-45



Rail size	Part Number	Applicable Rail type			Dimensions	Weight (g)	Rated Holding Force(N)
		THK	IKO	NSK	H(mm)		
#15	RBH15XXX	SRS SR	–	NS	22.5	79	400
		HSR	LWE LWH	NH	24	79	400
#20	RBH20XXX	SR	LWE	NS	26.5	88	400
		SHS	–	–	27	88	400
		HSR	LWH	NH	28.5	88	400
#25	RBH25XXX	SR	–	NS	28.5	85	400
		–	LWE	–	30	85	400
		SHS	–	–	31.5	85	400
		HSR	LWH	NH	33	85	400
#30	RBH30XXX	SRS SR	–	NS	36	140	400
		–	LWE LWH	–	38	140	400
		HSR	–	NH	40	140	400
#35	RBH35XXX	SHS	–	–	40	138	400
		HSR SR	LWE LWH	NS NH	42	138	400
#45	RBH45XXX	SHS	–	–	46	135	400
		–	LWE LWH	–	48	135	400
		SR	–	–	50	135	400
		HSR	–	NH	52	135	400

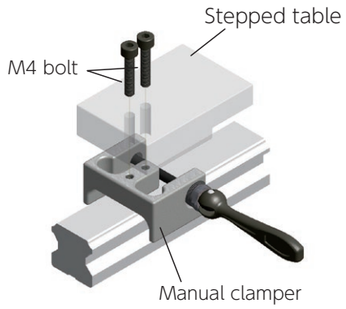
※Holding force is static load which acts on rail in longitudinal direction when clamping ON but no load to the clamper.
※Holding force will decrease by approx. 50% of rated value when rail and/or friction plates are not clean enough due to grease or abrasion powder and so forth. Please keep rail surface and friction plates clean condition.
※Please adjust clearance between rail and manual clamper when holding force does not reach to the rated value.
※Please pay careful attention when mounting, as the lever has flipping and raising directions.

Mounting Examples

If the height of the main unit (dimension H) differs from the height of the bearing of the rail used, please use a stepped table or an adapter plate.

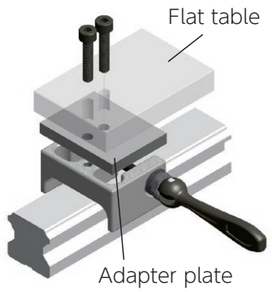
With stepped table

Adapter plate is NOT necessary



With flat table

Adapter plate is necessary



CALIPER BRAKES

BMK, BMKE type

BMK (Air-actuated) type
To generate big braking and holding force by air-pressure of 0.6 ~ 0.7 MPa.
Adjustable braking and holding forces by changing air pressure.

BMKE (Spring Braking) type
Normal Close type (Release by Compressed Air).
Holding Force 500 ~ 1120 N (0.4/0.6 MPa) are generated by spring power.

Normal Open type

Normal Close type

Normal Open type

Caliper Brakes BMK type (Air-actuated type)

Features

- To generate big braking and holding force by air-pressure of 0.6 ~ 0.7 MPa
- Adjustable braking and holding forces by changing air-pressure
- Friction facings are heat resistant type
- Easy to replace friction facings
- No lubrication is required
- Mounting is done by bolt and positioning pin

Construction and Actuation

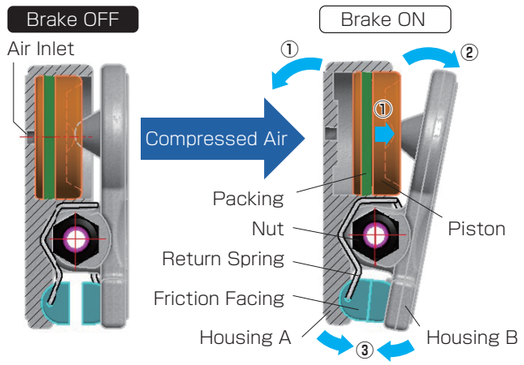
▶ When actuated

BMK type caliper brake is actuated by compressed air;

① The injected air works to push Piston out from Housing A,

② Piston pushes Housing B,

③ Hub serves as a fulcrum, and friction facings catch both sides of plate surfaces by bigger power using principle of leverage.

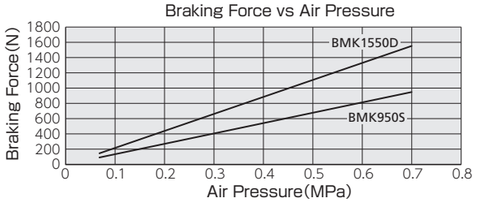


▶ When released

When compressed air is evacuated, the brake is released by return spring.

Air Pressure and Braking Force

■ BMK950S・BMK1550D

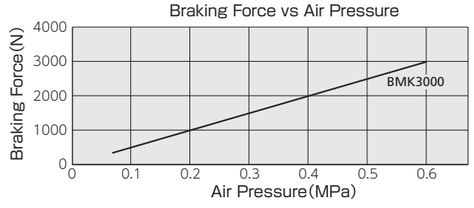


Calculation Formula of Braking Force

$Bf = K \times P$

Bf:Braking Force(N) K(Factor): 1357.1(BMK950S) P:Air Pressure(MPa)
2214.2(BMK1550D)

■ BMK3000

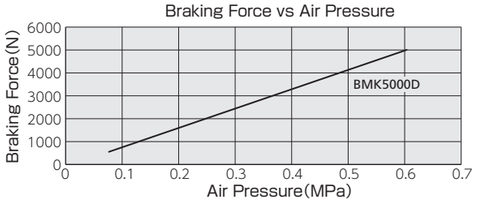


Calculation Formula of Braking Force

$Bf = K \times P$

Bf:Braking Force(N) K(Factor): 4952.6 P:Air Pressure(MPa)

■ BMK5000D



Calculation Formula of Braking Force

$Bf = K \times P$

Bf:Braking Force(N) K(Factor): 8333.3 P:Air Pressure(MPa)

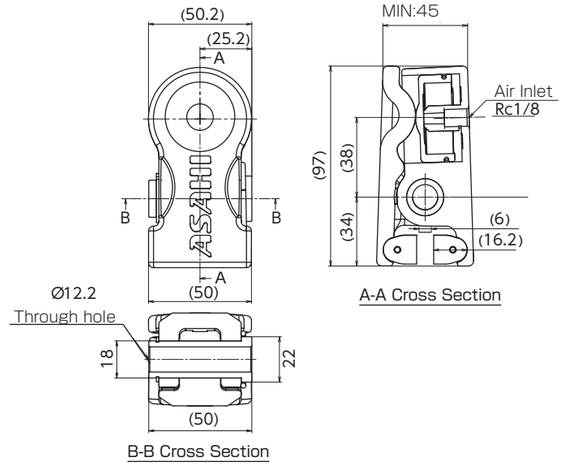
Note 1. The Caliper Brake may not obtain maximum braking force, during when the temperature of Friction Facings and linear plate/rail does not reach 100℃, and the braking force may be 60 ~ 70% of rated values.

2. Put safety factors sufficiently into your consideration for selection, if the Brake is used for the purpose of holding.

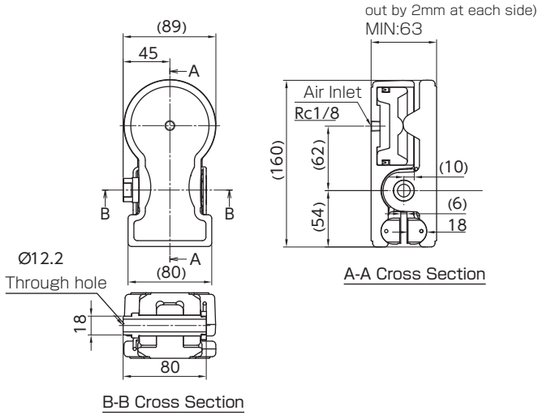
Dimensions

(unit : mm)

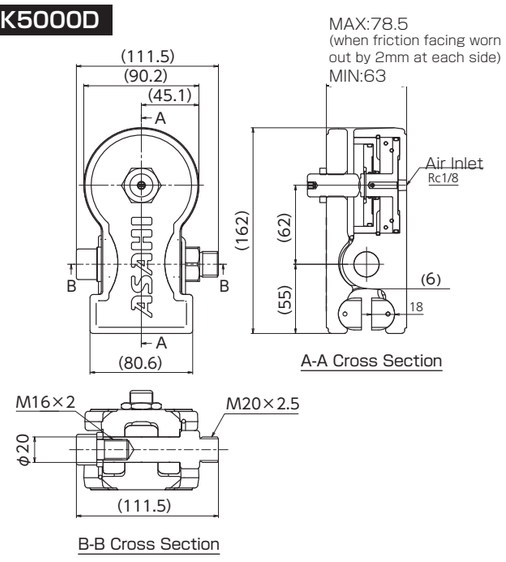
BMK950S・BMK1550D



BMK3000

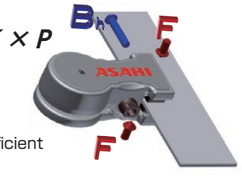


BMK5000D



Braking Force Bf is the force to have a moving object decelerate or stop.

$Bf = 2 \cdot F \cdot \mu = K \times P$



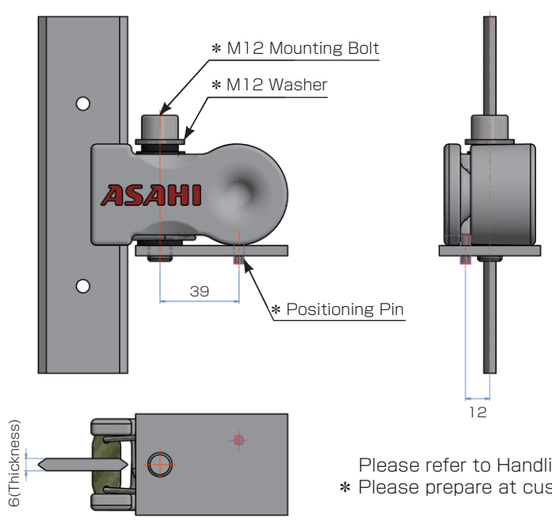
Bf: Braking Force (N)
F: Pressing Force (N)
μ: Dynamic Friction Coefficient

Technical Information

Part Number	Max. Applicable Air Pressure (MPa)	Max. Braking Force (N)	Air Chamber Volume (cm^3)		Friction Facing		Max. Cycle per Minute (cpm)	Weight (kg)
			Min.	Max.	Wear Allowance (cm^3)	Wear Coefficient(cm^3/J)		
BMK950S	0.7	950	21.4	32.6	1.8	1.50×10^{-8}	60	1.0
BMK1550D	0.7	1550	2.1	19.7	1.8	1.50×10^{-8}	60	1.2
BMK3000	0.6	3000	14.05	42.15	5.7	1.00×10^{-8}	60	1.9
BMK5000D	0.6	5000	15.4	57.4	5.7	1.60×10^{-8}	20	1.8

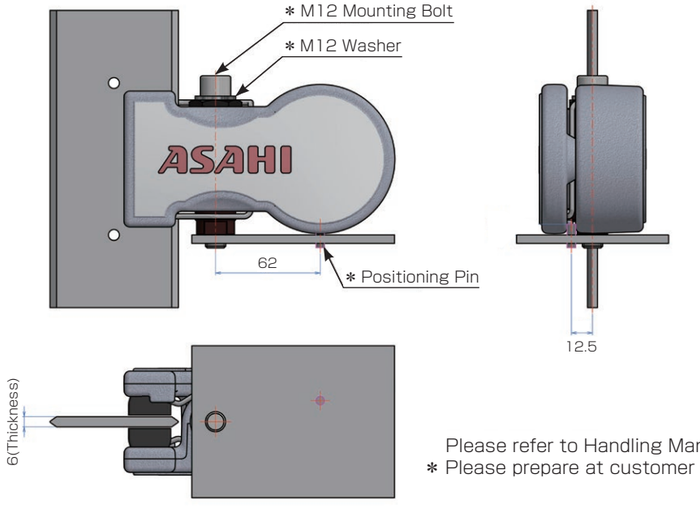
Mounting

■ BMK950S/1550D



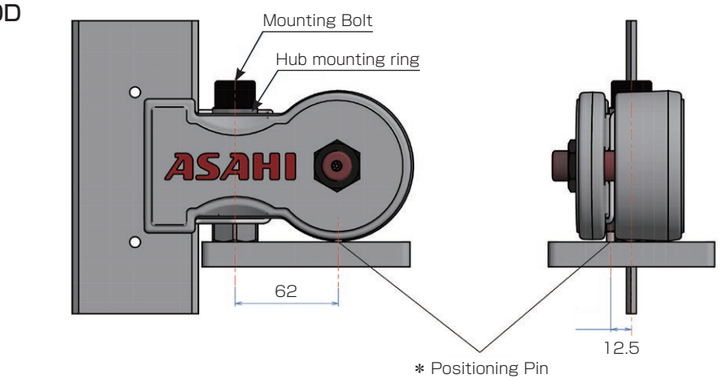
Please refer to Handling Manual for details.
＊Please prepare at customer side.

■ BMK3000



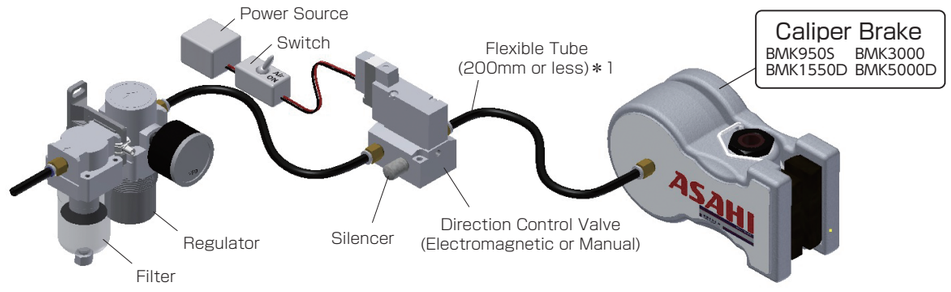
Please refer to Handling Manual for details.
＊Please prepare at customer side.

■ BMK5000D



Please refer to Handling Manual for details.
＊Please prepare at customer side.

Piping Example

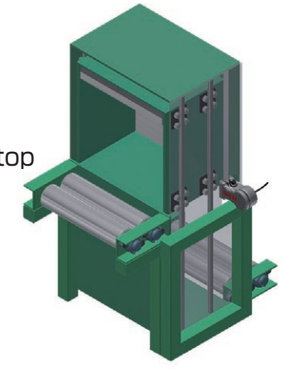


＊1: Response time becomes longer if piping length is more than 200mm.

Application Example

Elevating Equipment

- Positioning and holding with straight rail
- Also for purposes of fall prevention and emergency stop



Caliper Brakes BMKE type (Spring Braking type)

Features

- Normal Close type (Release by Compressed Air)
- Selectable Release Pressure (0.4MPa・0.6MPa)
- Holding Force 500 ～ 1120 N (0.4MPa・0.6MPa) are generated by spring power
- Even when friction facings abrade, power of braking spring can be 100% utilized by adjusting piston receiver
- Compact Design
- No lubrication is required
- Easy to replace friction facings

Construction and Actuation

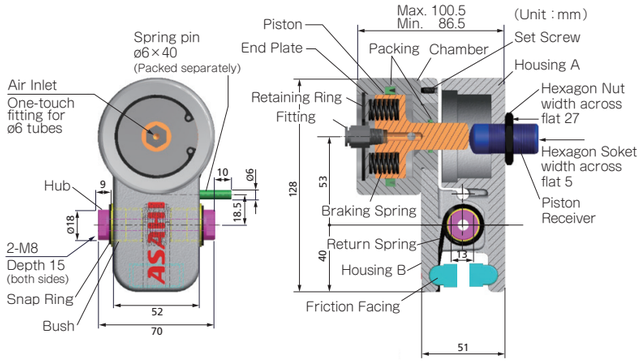
▶ When braking

BMKE type caliper brake works by power of braking spring;

① Piston and End Plate push one another,

② Piston pushes Piston Receiver in Housing A,

③ Hub serves as a fulcrum, and friction facings catch both sides of plate surfaces by bigger power using principle of leverage.

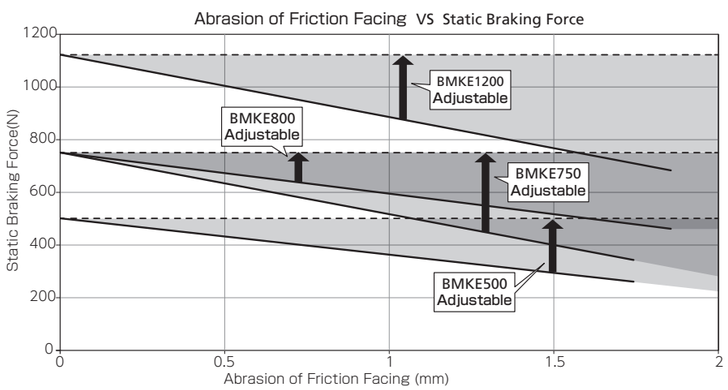


▶ When released

When compressed air injected, braking spring is compressed, and the brake is released by return spring

Note: Quantity of braking springs used is different between BMKE500 and BMKE750.

Abrasion of Friction Facing and Static Braking Force



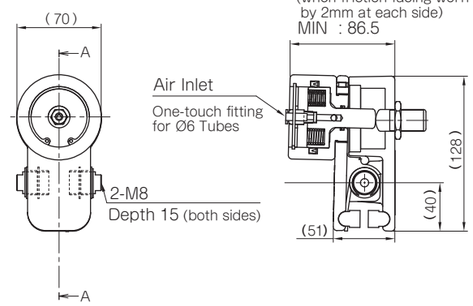
Note 1. The Caliper Brake may not obtain maximum braking force, during when the temperature of Friction Facings and linear plate/rail does not reach 100℃, and the braking force may be 60 ～ 70 % of rated values.

2. Put safety factors sufficiently into your consideration for selection, if the Brake is used for the purpose of holding.

Dimensions

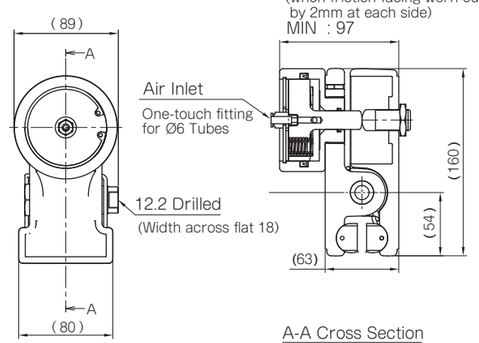
(Unit : mm)

BMKE500-750



A-A Cross Section

BMKE800-1200



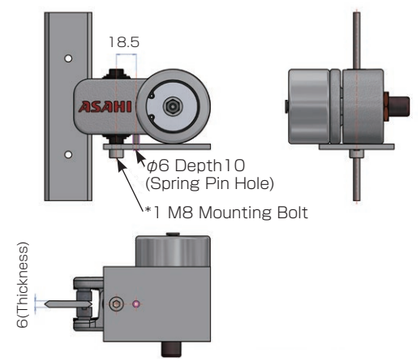
A-A Cross Section

Technical Information

Part Number	Air Pressure for release (MPa)	Static Braking Force (N)	Air Chamber Volume (cm^3)	Friction Facing		Weight (kg)
				Wear Allowance (cm^3)	Wear Coefficient (cm^3/J)	
BMKE500	0.4	500	16.67	1.80	1.86×10^{-8}	1.2
BMKE750	0.6	750	16.67	1.80	1.86×10^{-8}	1.2
BMKE800	0.4	750	32.11	5.7	1.00×10^{-8}	1.9
BMKE1200	0.6	1120	32.11	5.7	1.00×10^{-8}	1.9

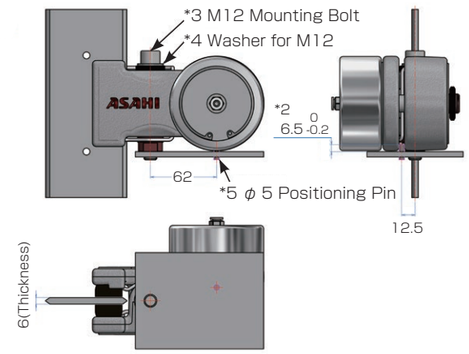
Mounting Example

■ BMKE500-750



*1 Please prepare at customer side.
Spring Pin is factory attached.

■ BMKE800-1200



*2 This dimension is extruded height of Positioning Pin from mounting surface of machine frame. As for the pin hole, please keep depth 5mm or more.

*3,4,5 Please prepare at customer side.

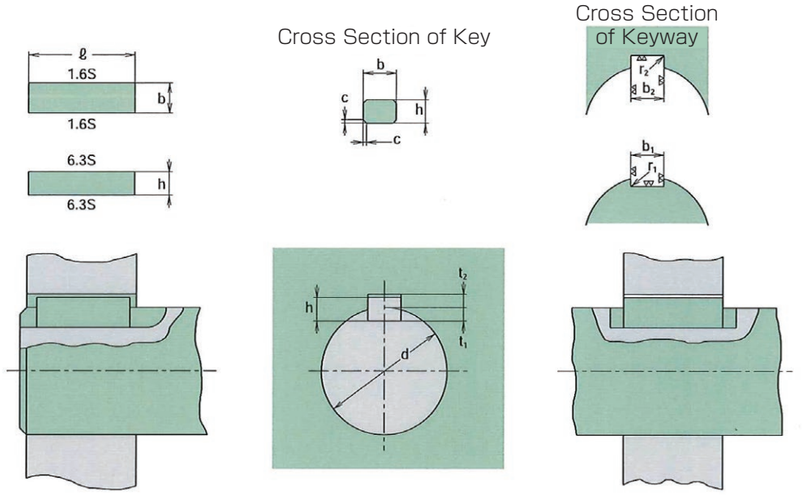
Shaft and Mounting Hole Tolerance

Unit: μm

Dimension (mm)		Shaft Tolerance											Mounting Hole Tolerance									
		g	h				js		j		k		m	F	G		H				JS		K
Over	or less	g6	h6	h7	h8	h9	js6	js7	j6	j7	k6	k7	m6	F7	G6	G7	H6	H7	H8	H9	JS6	JS7	K7
–	3	- 2 - 8	0 - 6	0 -10	0 -14	0 -25	±3	±5	+ 4 - 2	+ 6 - 4	+ 6 0	+10 0	+ 8 + 2	+ 16 + 6	+8 +2	+12	+ 6 0	+10	+14	+25	±3	±5	0 -10
3	6	- 4 -12	0 - 8	0 -12	0 -18	0 -30	±4	±6	+ 6 - 2	+ 8 - 4	+ 9 + 1	+13 + 1	+12 + 4	+ 22 + 10	+12 +4	+16	+ 8 0	+12	+18	+30	±4	±6	+ 3 - 9
6	10	- 5 -14	0 - 9	0 -15	0 -22	0 -36	±4.5	±7.5	+ 7 - 2	+10 - 5	+10 + 1	+16 + 1	+15 + 6	+ 28 + 13	+14 +5	+20	+ 9 0	+15	+22	+36	±4.5	±7.5	+ 5 -10
10	18	- 6 -17	0 -11	0 -18	0 -27	0 -43	±5.5	±9	+ 8 - 3	+12 - 6	+12 + 1	+19 + 1	+18 + 7	+ 34 + 16	+17 +6	+24	+11 0	+18	+27	+43	±5.5	±9	+ 6 -12
18	30	- 7 -20	0 -13	0 -21	0 -33	0 -52	±6.5	±10.5	+ 9 - 4	+13 - 8	+15 + 2	+23 + 2	+21 + 8	+ 41 + 20	+20 +7	+28	+13 0	+21	+33	+52	±6.5	±10.5	+ 6 -15
30	50	- 9 -25	0 -16	0 -25	0 -39	0 -62	±8	±12.5	+11 - 5	+15 -10	+18 + 2	+27 + 2	+25 + 9	+ 50 + 25	+25 +9	+34	+16 0	+25	+39	+62	±8	±12.5	+ 7 -18
50	80	-10 -29	0 -19	0 -30	0 -46	0 -74	±9.5	±15	+12 - 7	+18 -12	+21 + 2	+32 + 2	+30 +11	+ 60 + 30	+29 +10	+40	+19 0	+30	+46	+74	±9.5	±15	+ 9 -21
80	120	-12 -34	0 -22	0 -35	0 -54	0 -87	±11	±17.5	+13 - 9	+20 -15	+25 + 3	+38 + 3	+35 +13	+ 71 + 36	+34 +12	+47	+22 0	+35	+54	+87	±11	±17.5	+10 -25
120	180	-14 -39	0 -25	0 -40	0 -63	0 -100	±12.5	±20	+14 -11	+22 -18	+28 + 3	+43 + 3	+40 +15	+ 83 + 43	+39 +14	+54	+25 0	+40	+63	+100	±12.5	±20	+12 -28
180	250	-15 -44	0 -29	0 -46	0 -72	0 -115	±14.5	±23	+16 -13	+25 -21	+33 + 4	+50 + 4	+46 +17	+ 96 + 50	+44 +15	+61	+29 0	+46	+72	+115	±14.5	±23	+13 -33
250	315	-17 -49	0 -32	0 -52	0 -81	0 -130	±16	±26	+16 -16	+26 -26	+36 + 4	+56 + 4	+52 +20	+108 + 56	+49 +17	+69	+32 0	+52	+81	+130	±16	±26	+16 -36
315	400	-18 -54	0 -36	0 -57	0 -89	0 -140	±18	±28.5	+18 -18	+29 -28	+40 + 4	+61 + 4	+57 +21	+119 + 62	+54 +18	+75	+36 0	+57	+89	+140	±18	±28.5	+17 -40
400	500	-20 -60	0 -40	0 -63	0 -97	0 -155	±20	±31.5	+20 -20	+31 -32	+45 + 5	+68 + 5	+63 +23	+131 + 68	+60 +20	+83	+40 0	+63	+97	+155	±20	±31.5	+18 -45

Note 1. In each section, upper value shows highest tolerance and lower value lowest tolerance.
Note 2. Above values are as per JIS specification No.B 0401.

Keys and their corresponding keyways



Unit: mm

Nominal Key Dimension b × h	Key Dimension b Basic Dimension	Key Dimension b Tolerance (h9)	Key Dimension h Basic Dimension	Key Dimension h Tolerance		c	ℓ	Keyway Dimension b1・b2 Basic Dimension	Keyway Dimension Tight Fit type b1 and b2 Tolerance (P9)	Keyway Dimension Normal Fit type b1 Tolerance (N9)	Keyway Dimension Normal Fit type b2 Tolerance (Js9)	Keyway Dimension r1 and r2	Keyway Dimension t1 Basic Dimension	Keyway Dimension t2 Basic Dimension	Keyway Dimension r1・r2 Tolerance	Reference Applicable Shaft Dia. d
2 × 2	2	0 -0.025	2	0 -0.025	h9	0.16 ~0.25	6~ 20	2	-0.006 -0.031	-0.004 -0.029	±0.0125	0.08 ~0.16	1.2	1.0	+0.1 0	6~ 8
3 × 3	3		3				6~ 36	3					1.8	1.4		8~ 10
4 × 4	4	0 -0.030	4	0 -0.030			8~ 45	4	-0.012 -0.042	0 -0.030	±0.0150		2.5	1.8		10~ 12
5 × 5	5		5			0.25 ~0.40	10~ 56	5				0.16 ~0.25	3.0	2.3		12~ 17
6 × 6	6		6				14~ 70	6					3.5	2.8		17~ 22
(7 × 7)	7	0 -0.036	7	0 -0.036			16~ 80	7	-0.015 -0.051	0 -0.036	±0.0180		4.0	3.3	+0.2 0	20~ 25
8 × 7	8		7	0 -0.090	h11		18~ 90	8					4.0	3.3		22~ 30
10 × 8	10		8			0.40 ~0.60	22~110	10				0.25 ~0.40	5.0	3.3		30~ 38
12 × 8	12	0 -0.043	8				28~140	12	-0.018 -0.061	0 -0.043	±0.0215		5.0	3.3		38~ 44
14 × 9	14		9				36~160	14					5.5	3.8		44~ 50
(15 × 10)	15		10				40~180	15					5.0	5.3		50~ 55
16 × 10	16		10				45~180	16					6.0	4.3		50~ 58
18 × 11	18		11	0 -0.110			50~200	18					7.0	4.4		58~ 65
20 × 12	20	0 -0.052	12			0.60 ~0.80	56~220	20	-0.022 -0.074	0 -0.052	±0.0260	0.40 ~0.60	7.5	4.9		65~ 75
22 × 14	22		14				63~250	22					9.0	5.4		75~ 85
(24 × 16)	24		16				70~280	24					8.0	8.4		80~ 90
25 × 14	25		14				70~280	25					9.0	5.4		85~ 95
28 × 16	28		16				80~320	28					10.0	6.4		95~110
32 × 18	32		18				90~360	32					11.0	7.4		110~130
(35 × 22)	35	0 -0.062	22	0 -0.130		1.00 ~1.20	100~400	35	-0.026 -0.088	0 -0.062	±0.0310	0.70 ~1.00	11.0	11.4	+0.3 0	125~140
36 × 20	36		20				–	36					12.0	8.4		130~150
(38 × 24)	38		24				–	38					12.0	12.4		140~160
40 × 22	40		22				–	40					13.0	9.4		150~170
(42 × 26)	42		26				–	42					13.0	13.4		160~180
45 × 25	45		25				–	45					15.0	10.4		170~200
50 × 28	50		28				–	50					17.0	11.4		200~230

Note1 : Please do not use keys with parenthesis among nominal key dimensions, as much as possible.
Note2 : Above Values are as per JIS specification No.B1301-1996.

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